IN THE UNITED STATES DISTRICT COURT FOR THE
NORTHERN DISTRICT OF OKLAHOMA

W. A. DREW EDMONDSON, in his capacity as ATTORNEY GENERAL OF THE STATE OF OKLAHOMA and OKLAHOMA SECRETARY OF THE ENVIRONMENT C. MILES TOLBERT, in his capacity as the TRUSTEE FOR NATURAL RESOURCES FOR THE STATE OF OKLAHOMA,	)
Plaintiff,	)
vs.	) 4:05-CV-00329-TCK-SAJ
TYSON FOODS, INC., et al,	)
Defendants.	)

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THE VIDEOTAPED DEPOSITION OF ANDY DAVIS, PhD, produced as a witness on behalf of the Plaintiff in the above styled and numbered cause, taken on the 7th day of April, 2009, in the City of Tulsa, County of Tulsa, State of Oklahoma, before me, Lisa A. Steinmeyer, a Certified Shorthand Reporter, duly certified under and by virtue of the laws of the State of Oklahoma.

A P P E A R A N C E S

FOR THE PLAINTIFFS:	Mr. Richard Garren Attorney at Law 502 West 6th Street Tulsa, OK 74119
FOR TYSON FOODS:	Mr. Bryan Burns Attorney at Law 2210 West Oaklawn Drive Springdale, AR 72762
FOR CARGILL:	Ms. Melissa Collins Attorney at Law 1700 Lincoln Street Suite 3200 Denver, CO 80203
FOR GEORGE'S:	Mr. Gary Weeks Attorney at Law 221 North College Fayetteville, AR 72701 (Via phone)

I N D E X

(Whereupon, the deposition began at 8:51 a.m.)

VIDEOGRAPHER: We are now on the Record for the deposition of Dr. Andy Davis. Today is April 7th, 2009. The time is 8:51 a.m. Would counsel please identify themselves for the Record? 08:51AM

MR. GARREN: Richard Garren, State of Oklahoma.

MS. COLLINS: Melissa Collins for the Cargill defendants. 08:51AM

VIDEOGRAPHER: Thank you. The witness may be sworn in.

ANDY DAVIS, PhD

having first been duly sworn to testify the truth, the whole truth and nothing but the truth, testified as follows:

DIRECT EXAMINATION

BY MR. GARREN:

Q Dr. Davis, please state your full name and residence for the Record? 08:51AM

A Andy Davis, Boulder, Colorado.

Q Do you have a street address in Boulder, Colorado?

A 2295 Baseline Road.

Q Okay. Dr. Davis, last night I was handed a 08:51AM

package about 4:30 or a quarter until 5:00 of an errata and some documents attached to your report. This is the Appendix B to your document, and I'd like to ask some questions about it, if you would, please. I apologize for the copy but that's all we could -- I could make this morning in getting ready. So if you have to look at my color -- the original, which I have in my hand, we can do that, but I don't think it will be necessary. Let's just start through this. I put page numbers on yours so we can -- so we could follow along, but I want to ask you about what's contained in this Appendix B that's been attached. Looking at Page 2 of the document, that's a new image that was not contained in your original report, is that correct, in your original Appendix B? 08:52AM 08:52AM 08:52AM

A Well, I can't tell. Let's see. Do you have the original as well?

MR. GARREN: Do you have a copy for him there to look at? 08:53AM

A Thank you.

Q Okay. Would you agree with me that -- maybe what I need to do is mark that, too, so we're not really confused on what's what. Let's just stick that on the front, if you would. Okay. We're going 08:53AM

to refer to Exhibit 16 as your revised Exhibit B or Appendix B, okay, and you have the original there in front of you also; correct?

A That's correct.

Q All right. Look at Page 2 of your -- of Exhibit 16, the revised Appendix B. Would you agree with me that that's a new image that does not appear in your original report? 08:54AM

A Actually it does appear but it's -- in the original report, as you can see, on the first page it's merely a depiction of where the houses are that are on this figure here of the Illinois River watershed but here they're in white. I just wanted to simply highlight the location without the data so to speak there. 08:54AM

Q You would agree, though, that it's a new image that you've created on Page 2 --

A Yes, it is.

Q -- of your new appendix?

A It's a new image but it's not new information. 08:54AM

Q Okay. Let's go over to Page 5 of Exhibit 16. Again, this is a new image added to your report. Can you confirm that, please? This is in reference to Site OK-02.

A Yes, that's correct. 08:55AM

Q So this has been added to your report and it's not included originally; is that true?

A That is correct.

Q It's not replacing anything that was in your report before, is it? 08:55AM

A Well, it's actually very similar to the image on top of what you're referring to as Page 4, yes.

Q Dr. Davis, would you agree with me that the image on Page 5 is a new image different from the images that are in your original report for Site OK-02? 08:55AM

A It's a slightly different variant, yes.

Q Look at Page 7 of Exhibit 16, and would you agree, sir, that that page contains two images for Site OK-03 that do not appear in your original report? 08:56AM

A Same thing. Slight differences, but essentially the one on Page 7 of the new one, as you define it, is very similar with the bottom one on the OK-03 original. 08:57AM

Q While you say they're similar, would you agree with me, sir, in response to my question, they are in fact different and added to your report that were not in your report earlier?

A Yes, slight differences. 08:57AM

Q All right, and on the next page, Page 8 of Exhibit 16, at the top of the page there is again a new image that was not contained as you see it in Exhibit 16 in your original report?

A On Page 8 you say? 08:57AM

Q Page 8, the top image, is that also a new image that was not contained in your original report?

A Yes. It's got some of the original -- same data but it's a larger pan, so it has some more 08:57AM information on it, that's correct.

Q It's a different image, is it not, added to your report since your original report?

A It's similar but it's got some slight differences, yes. 08:57AM

Q And look at Page 13 of the Exhibit 16 dealing with Site OK-6. Same question. Do you agree that the image in your amended report Page 13 is not included in your original report?

A That's correct. That's not in the original 08:58AM report, although the data on it would be in one of the other figures.

Q Again, sir, my question is, is that image different and now a new image added to your report that was not in it originally? 08:58AM

A Yes, it's an additional image.
Q All right. Look at Page 22 of Exhibit 16. This one deals with Site AR-12. Same question. Do you agree that the two images on Page 22 in Exhibit 16 do not exist but were added to your report? 08:59AM
A On Page 20?
Q 22 in Exhibit 16.
MS. COLLINS: And which site is that again, I'm sorry, AR-12?
MR. GARREN: It deals with AR-12. 08:59AM
Q In your --
A Yeah, same thing. The images are slightly different. Much of the data is already presented on previous figures.
Q You would agree with me, sir, that those two images were not included in your original report? 08:59AM
A Those specific images, that's correct.
Q All right, and the very next page, 23, dealing again with that same site location, AR-12, that image was not included in your original report but has now been added; would you agree? 09:00AM
A The image is slightly different and, again, the data has been presented in a previous report.
Q The image on Page 23 of Exhibit 16 does not exist as we see it in Exhibit 16 in your original 09:00AM

report, does it?
A The actual image, yes, but, again, the data is on there previously.
Q My question is about the image. It's a new image added; correct? 09:01AM
A The image is a new image.
Q All right. Look at the Page 26, sir, of Exhibit 16. This one deals with Site AR-14 on Page 26.
MR. GARREN: Is someone in on -- did we have somebody add in on the depo? 09:01AM
MR. WEEKS: Gary Weeks with Bassett Law Firm.
MR. GARREN: All right. Anyone else on the phone? 09:01AM
Q Would you agree, sir, that Exhibit 16, Page 26 is a new image that was not included in your original report for Site AR-14?
A Yes. The image is new, but as I said before, the data is previously provided. 09:02AM
Q Look at Page 47, if you would, please. This one deals with Site AR-30. It's the image at the bottom half of the page. Do you agree, sir, that you removed a data point entry from the lower image on Page 47 in Exhibit 16 that was present in your 09:02AM

original report?

A I removed a data point?

Q Yes, sir. Do you see the data point 0.9386 in your report?

A I see that one, yes. 09:03AM

Q And do you see that it's not present in your Appendix B, Exhibit 16 amendment?

A That's correct. The reason is because it's a slightly different orientation, and so in this particular orientation that data point is covered 09:03AM up.

Q Looking at the next page of Exhibit 16, Page 48, Exhibit 16, that image has had changes made to it from what was in your original report; is that correct? You added two data points, sir, that 09:03AM weren't there before?

A Let's see. Looking at what page again?

Q Page 48. Did you add the data point in the middle, .9386, that wasn't present before?

A Well, it was present before. It's just not 09:04AM showing because, again, it's a different orientation of the data.

Q Would you agree with me it doesn't show up in your report in your original image?

A That's correct, it doesn't show up. 09:04AM

Q And would you agree with me then that in your original report and the original image, it does not have the citation to the City of Lincoln water -- wastewater treatment plant listed in your original report? 09:04AM

A I would agree with you on that.

Q All right, and one other annotation change that you made is that you've added a sampling point that says 1092.0033 that was -- that's shown in your Exhibit 16 but not shown in your original report? 09:04AM

A Well, I didn't add the data point. It was there all the time. Again, it's just the orientation of the view.

Q Would you agree with me, sir, it does not show up in your original report? 09:04AM

A It doesn't show up in the original report, that's correct.

Q All right, and there's no way in looking at your original report to know that that data point is there, is there? 09:05AM

A Well, of course. All you have to do is go to Site AR-30 and you've got 1092.0033 clearly defined.

Q And the image that we're comparing, sir, it does not show up, does it?

A No, but it's on -- in the very first figure 09:05AM

here.

Q All right. Let's go back to Page 53 dealing with Site AR-34. Would you agree, sir, that you've added a page with two images in your Exhibit 16 appendix that did not exist in your previous report? 09:05AM

A Hang on. Just trying to catch up with you here. The image isn't here but, again, the data is essentially captured in the previous images.

Q You agree with me, sir, that this is two images added that were not present in your original report? 09:06AM

A Yes, an additional view.

Q All right. Let's go on then to Page 55, and the 55 page is in Exhibit 16 dealing with Site AR-35. The lower half of the page on Exhibit 16 is a new image not previously shown in your report; is that correct? 09:06AM

A That's correct, same thing, though the data is present. It's just a new vision.

Q Looking at Page 56, that page and that image was never contained in your original report, was it? 09:07AM

A No. The image is different but, again, the data is presented in the original report.

Q Agree, sir, if you would, please, that this is a new page added with a new image that was not 09:07AM

previously contained in your original report?
A I agree, but the important thing is whether the data was there, and the data are on the previous report.
Q I ask his response that was not responsive be stricken. All right. Do you agree with me, sir, that the images that we see that you've added could have been prepared and included in your report at the initial report? 09:07AM
A The objective was to clarify the information and to provide as an errata additional views that support the conclusions I've made. Whether it could have been or not is really irrelevant. 09:08AM
Q Sir, let me ask you the question again and I'd ask you to answer my question. Would you agree with me that the new images that we've identified could have been prepared and submitted with your original report, yes or no? 09:08AM
A Well, it could have been, but it's not to that point in time. 09:08AM
Q And you didn't do that; correct?
A That's correct.
Q You provided last night or through your counsel a CD that had several additional pages of material considered by you which were photos with a 09:09AM

Bates stamp number Davis 00749 through 0812. Are you familiar with those photos?

A You're talking about the trip photos?

Q I'm not -- sir, they're not identified, so I'm asking, are you familiar with the photos 749 through 812 that were supplied to the State of Oklahoma late yesterday afternoon? 09:09AM

A Can I see them and then I can confirm that?

Q I don't have copies with me.

A Well, in that case I can't confirm what's in it what you are calling them, so- 09:09AM

MR. GARREN: Let's go off the Record a second and I'll load up some --

VIDEOGRAPHER: We are now off the Record. The time is 9:09 a.m. 09:09AM

(Following a short recess at 9:09 a.m., proceedings continued on the Record at 9:11 a.m.)

VIDEOGRAPHER: We are back on the Record. The time is 9:11 a.m.

Q Dr. Davis, while off the Record, I allowed you to look at an electronic version of your photos provided late yesterday afternoon to the State that are Bates numbered Davis 0749 through 0812. Did you recognize those photos? 09:11AM

A Yes. 09:11AM

Q Did you take those photos?
A Yes.
Q When did you take those photos?
A Last week.
Q And where were those photos taken generally speaking? 09:11AM
A In and around the Illinois River watershed.
Q And why did you take those photos last week?
A Because I wanted a photo record of the places I had visited. 09:12AM
Q Okay, and those were places that you visited for the first time last week?
A That's correct.
Q Where are the native files that make up these photos that we've seen as Davis 749 to 0812? 09:12AM
MS. COLLINS: Object to form.
A What do you mean; what do you mean the native files?
Q Well, did you take these with old film or electronic version digital? 09:12AM
A Digitally.
Q All right, and whose camera did you use?
A Mine.
Q And do you still have possession of that camera? 09:12AM

A Yes.
Q And do you still have those images that were originally taken in the camera or have they all been downloaded?
A I downloaded them to that file you have on your computer. 09:13AM
Q Okay. So what was the date that you actually took those pictures?
A Oh, it would have been last Tuesday and Wednesday. 09:13AM
Q So it would have been March 30th and April 1, is that correct, March 31st and April 1? That's Tuesday and Wednesday of last week.
A It's either that or Wednesday or Thursday. I'd have to go back to my Daytimer. 09:13AM
Q Okay. Was anyone else present when you took those pictures?
A Yes.
Q Who else was present?
A It was Ken Kolm from my office. 09:13AM
Q Can you spell his last name for the Record?
A K-O-L-M.
MS. COLLINS: I'll represent to you that it was April 1st and 2nd.
MR. GARREN: Thank you. 09:14AM

Q Anyone else present?
A There was somebody called Tim. I forget his last name.
Q Tim, and do you know why he was there?
A He was a Cargill representative. 09:14AM
Q Was his name Tim Alsup or Tim Maupin?
A I don't recall.
Q When did you meet him for the first time?
A When I went to the site.
Q Which site? 09:14AM
A Well, during that tour.
Q Pardon me?
A During the tour.
Q During the tour. Did he start with you or just meet you at some point? 09:14AM
A He met us at the hotel.
Q And so he went on the entire tour where all these pictures were taken?
A That's correct.
Q Okay. Besides Tim and Ken, who else attended with you on this photo excursion? 09:14AM
A There was a lawyer called Chris.
Q And do you know Chris' last name?
A Not as I sit here right now, no. I forget.
Q Anyone else? 09:15AM

A That was the entire party.
Q Would you agree with me, sir, that none of these photos have been referenced in your original report?
A Yes. 09:15AM
Q And would you agree with me that none of these photos have been referenced in your errata as you prepared and delivered to the State yesterday late?
MS. COLLINS: Object to form.
A I believe they were provided along with the errata. 09:15AM
Q Would you -- let me restate it. Maybe I wasn't clear. Did you make any specific reference to any of the photos that were taken in your errata?
A No. 09:15AM
Q Are there any descriptions telling where those photos were taken?
A Yes. That was provided along with the photos.
Q And how was it provided?
A As a PDF, a map with some annotations on it. 09:16AM
Q Okay, and that's the first time the State has seen that map; correct?
A I suppose so, yes.
Q Well, it was created solely for the purposes of identifying where you took the photos; is that 09:16AM

what I'm understanding you to say?
A That's correct.
Q All right. Change the subject here a little bit, Dr. Davis. Do you agree that for decades it has been known that agricultural land use practices have adversely impacted water quality in the United States? 09:16AM
MS. COLLINS: Object to form.
A I don't know. I haven't studied that particular issue. 09:17AM
Q All right. Do you know, sir, whether or not for decades it has been known that agricultural land use practices have adversely impacted the water quality in the Illinois River watershed?
MS. COLLINS: Object to form. 09:17AM
A Again, I haven't studied that particular issue.
Q All right. Do you agree sir, that phosphorus, as a constituent of poultry waste, will run off from land in the IRW where it has been land applied? 09:17AM
MS. COLLINS: Object to form.
A It depends on a number of factors, not the least of which is the proximity to water bodies and the potential for runoff.
Q Okay. Do you agree then it can? 09:17AM

A I don't know. I haven't looked generically at the process. I've looked at the Cargill-specific locations.
Q All right. So you're not giving an opinion whether or not in fact it has run off in the IRW; is that what I'm understanding you to say? 09:18AM
MS. COLLINS: Object to form.
A No. I have looked at the Cargill properties to determine if there's evidence to support that hypothesis. 09:18AM
Q Let me ask you, sir, was your trip April 1 and April 2 the first time you've been to the Illinois River watershed?
A For this purpose, yes.
Q Have you been there before other than the purpose of this case? 09:18AM
A I think I may have passed through on one of my previous trips but not specifically to look at turkey houses.
Q Well, when you passed through, what do you mean by that? 09:18AM
A Well, I've driven through it on the way to one of my other sites.
Q Another site being related to this case or some other case? 09:18AM

A No. Another case.
Q Where was that other site?
A As I recall, it was a project I was doing on chat in Oklahoma a few years ago.
Q And what -- where was it located? 09:18AM
A That was in the area around Picher I think.
Q All right, and do you know whether or not Picher is in or around the Illinois River watershed?
A No, it's not.
Q All right, and are you telling the court that 09:19AM you drove through the Illinois River watershed to get to Picher?
A Through some portion of it, yes.
Q And where did you drive from in order to go to Picher? 09:19AM
A As I recall, it was Little Rock I want to say.
Q All right. So you drove from Little Rock, to Picher, Oklahoma?
A As I recall, yes.
Q And when was this done? 09:19AM
A Several years ago.
Q All right, and at the time you drove through, were you engaged to work in this case?
A No.
Q So when you drove through, you didn't have any 09:19AM

knowledge that you would in fact be doing work in the Illinois River watershed in the future at that time; right?

A That's correct.

Q On your trip this April 1 and 2 that you took the photos, at where did you go other than the where the photos are represented. Are there places other than where you took photos that you observed in the Illinois River watershed where photos may not have been taken? 09:19AM 09:20AM

A Well, yes. I mean, we drove around the watershed, so obviously I'd have seen other places that weren't where the photos were taken.

Q Let me ask you this, sir: Did you in fact go to every Cargill grower site location? 09:20AM

A Yes.

Q So you visited every site location on April 1 and April 2 for the first time in this case; correct?

A Well, that's correct physically but, of course, I evaluated at some level of detail using the application I have what the sites looked like. So I wasn't completely a novice with the sites. 09:20AM

Q I'm asking you, though, physically to observe the sites, the first time you ever observed any 09:20AM

Cargill site was on April 1 or 2 of this year?
A Physically, that's correct, but I've been studying them for the previous two or three months.
Q When you were in the IRW on April 1 and April 2 of this year, did you conduct any field studies or scientific analysis or investigation? 09:21AM
MS. COLLINS: Object to form.
A Only from an observational perspective.
Q Okay. Did you take any samples of any soil, water or sediment? 09:21AM
A No.
Q Did you take any measurements of any of the physical sites that you visited?
A No.
Q Do you know whether or not the constituents of poultry waste can leach within the Illinois River watershed? 09:21AM
MS. COLLINS: Object to form.
A Do you mean percolate down through the horizon? 09:21AM
Q Yes, sir.
A It depends on the soil chemistry.
Q Have you, sir, studied the soil chemistry in the Illinois River watershed?
A Yes. 09:22AM

Q And how have you studied it?
A I have gone to peer-reviewed literature and am aware that it's a combination of ultisols and alfisols.
Q Is that published literature contained in your considered materials? 09:22AM
A I believe so, yes.
Q And can you tell me the name of the publication that you're referring to?
A I believe it's watershed-wide study. 09:22AM
Q Of the Illinois River watershed?
A Of -- I believe that's correct, yes.
Q It's, in fact, a different watershed?
A Let me see if I can identify it here in considered materials. 09:22AM
Q I don't have them here. I'm asking you whether or not you recall whether it dealt with a different watershed.
A No. It definitely dealt with the Illinois River watershed. 09:23AM
Q Okay, and how many published papers did you review to determine what the soils were in the Illinois River watershed?
A Well, it was identified in I think it was a USGS publication, along with climate and topography 09:23AM

and groundwater conditions and a variety of other environmental descriptions.

Q And is that the only source of information that you looked at in determining the soil makeup within the IRW? 09:23AM

A As I recall right now.

Q Do you agree, sir, that bacteria, as a constituent of poultry waste, will run off from land in the IRW from where it's been applied?

MS. COLLINS: Object to form. 09:23AM

A It depends where it's applied.

Q So you say it can; is that correct?

A I don't know. I haven't studied that.

Q All right, and have you studied whether or not bacteria can leach into the groundwater in the 09:24AM Illinois River watershed?

A No, I haven't.

Q Today am I understanding that you're not prepared as part of your report or your testimony to give an opinion whether or not poultry waste will 09:24AM run off from the land in the Illinois River watershed?

MS. COLLINS: Object to form, misstates testimony.

A What I said was I've evaluated that potential 09:24AM

for the Cargill houses.

Q And other than that, that is all that your opinions deal with; correct?

A That's correct.

Q All right, but you have not specifically studied or read peer-reviewed articles as to runoff potential or the runoff capability of poultry waste in the Illinois River watershed? 09:24AM

A No, I haven't focused on that. I've been looking at the Cargill properties. 09:24AM

Q Tell the court what are the constituents of concern that you dealt with for purposes of your report.

A Phosphorus.

Q Is that the sole constituent that you dealt with? 09:25AM

A For the purpose of my report, yes.

Q And that is the limitation of your opinions, that is -- let me restate that. Your opinions, therefore, are limited solely to phosphorus; is that correct? 09:25AM

MS. COLLINS: Object to form.

A Well, not completely just to phosphorus. There's other elements in my report that do other things, but it seems to be the tracer of most 09:25AM

concern to the State based on my review of the expert reports.

Q All right. Let me ask you this then, sir: With regard to other constituents of poultry waste, have you studied for purposes of your opinions in this case any other constituents of concern contained within poultry waste besides phosphorus? 09:25AM

MS. COLLINS: Object to form.

A For the purpose of my study, I glanced at other constituents such as nitrate, arsenic, copper and zinc in waters in the Illinois River watershed, but I didn't focus on them because that's not what the primary constituent is that seems to be of concern in this case. 09:26AM

Q So my question to you is, are you giving an opinion with regard to the fate and transport of nitrate from Cargill sites? 09:26AM

A No, not -- nowhere close to the same level of detail as I have with the phosphorus.

Q My question to you is, are you giving any opinion with regard to the fate and transport of nitrate from Cargill sites? 09:26AM

A Not at this point in time.

Q Are you giving any opinion in this case with regard to arsenic fate and transport from any 09:26AM

Cargill sites?

A Not at this point in time.

Q Are you giving any opinions in this case with regard to the fate and transport of copper from Cargill sites? 09:26AM

A Not at this point in time.

Q Are you giving any opinions in this case with regard to the fate and transport of zinc from Cargill sites?

A Not at this point in time. 09:27AM

Q All right. You in your report define Cargill as the Cargill Company and the growers. Am I correct on that? Let me hand you what's been marked Plaintiff's Exhibit 1, which is your report.

MS. COLLINS: This is the original report of January 29th? 09:27AM

MR. GARREN: Correct. You can see the January date on it. That's --

Q Do you see on Page 1 of your report where you refer to the 35 Cargill contract growers or Cargill owned, collectively Cargill locations? 09:27AM

A Yes.

Q All right. So when you use the word Cargill in your report, you're referring to the collective Cargill; is that true? 09:28AM

MR. BURNS: Object to form.

A That's correct.

Q All right. So for purpose of our deposition, you and I in communicating will agree when we use the term Cargill, we will mean both Cargill company owned or its contract growers unless we specify otherwise? 09:28AM

A Well, what we'll be talking about is the 35 specific locations I've evaluated.

Q All right. 09:28AM

A Whatever the terminology is for your use, but that's what I'm talking about.

Q Well, I'm using your same terminology. So if we use Cargill, we know that's what we're talking about; do you agree? 09:28AM

A Well, no. I'm talking about the 35 locations here.

Q I am, too.

A Okay. In that case, we're in 100 percent agreement. 09:28AM

Q Okay. Do you agree, sir, that phosphorus from land-applied poultry waste is getting into the water sources of the Illinois River watershed?

MS. COLLINS: Object to form.

A I've just looked at the 35 houses. I don't 09:29AM

really have an opinion on that.
Q And, thus, you aren't expected to express an opinion with regard to whether poultry from land applied -- whether phosphorus from land-applied poultry waste is getting into the water resources in the IRW; is that correct?
MS. COLLINS: Object to form.
A Well, it depends on location, and I was looking at the Cargill locations. I haven't studied other locations. 09:29AM
Q Okay. Let me ask you this, sir: Have you taken any samples in the Illinois River watershed for purposes of your analysis on the Cargill sites?
A No. I've relied on the State database.
Q Have you taken -- just so I'm clear, you've not taken, or people working for or under you, either soil, water or sediment samples in the Illinois River watershed for this case? 09:30AM
A That's correct. We've relied on the State database.
Q Are there any published papers not found in your considered materials that you relied on for purpose of forming any of your opinions in this case?
A Not that I recall right now. 09:30AM

Q Do you think that there are some but you're not recalling?

A Well, I have a long and storied history and so I have a substantial knowledge base in my head, and so some of my opinions probably are reflecting the 30 years experience I have, and obviously I can't think back to every document I've ever read in 30 years. 09:30AM

Q And how many specific experiences do you have with the water, soil, sediments, geology of the Illinois River watershed besides what you've done in this case? 09:31AM

A I don't recall. I don't think I have any, but my experience is based on my observation of behavior of constituents, their fate and transport in soils, groundwater and waters across the United States and internationally. 09:31AM

Q Do you know, sir, whether Cargill, specifically the 35 Cargill facilities that we're talking about -- 09:31AM

MS. COLLINS: Object to form.

Q -- have they -- has Cargill applied poultry waste to the lands in the Illinois River watershed to your knowledge?

MS. COLLINS: Object to form. 09:31AM

A From my study, I assumed that they applied litter proximal to the houses.

Q When you say proximal, what do you mean in distance?

A Well, in fields adjacent to the properties or the houses. 09:32AM

Q Fields adjacent to the houses or to the property? I'm not sure I understand.

A Adjacent to the houses on the property.

Q On the property? 09:32AM

A Yes.

Q Okay, and when you made that assumption, did you assume that for a period of a number of years or just one year; what's your assumption?

A I didn't have an assumption because I was looking at the data that had been collected by the State from 2005 through approximately 2008, thereabouts. 09:32AM

Q What history did you obtain with regard to the application of poultry waste at the Cargill 35 sites? 09:32AM

A I didn't have any information to that. That's why I just assumed it had been deposited on the sites adjacent to the houses.

Q Okay, and for what period of time did you 09:33AM

assume that these deposits had been made?
A I didn't make any assumptions in that regard.
Q And did you make any assumption with regard to the rate of application of poultry waste made at the Cargill sites? 09:33AM
MS. COLLINS: Object to form.
A No.
Q Do you have any knowledge as to how long poultry waste has been land applied at any or all of the Cargill sites? 09:33AM
A No.
Q Do you have any specific knowledge as to the rate of application of poultry waste at any of the Cargill sites?
MS. COLLINS: Object to form. 09:33AM
A No.
Q Do you agree that in the IRW poultry waste has historically been applied to satisfy the nitrogen needs of the grass crop?
MS. COLLINS: Object to form. 09:34AM
A My understanding is it's for the nitrogen, phosphorus, nutrients of the grass.
Q Prior to regulation controlling phosphorus, did you have any knowledge that the poultry waste being applied in the IRW was in order to satisfy the 09:34AM

nitrogen needs of the grass crops?

MR. BURNS: Object to form.

A I think I just answered that question. I thought it was for nitrate and the phosphate requirements. 09:34AM

Q Do you agree, sir, that if you're applying nitrogen for a grass crop -- let me restate that. Do you agree, sir, that if you are applying poultry waste in order to satisfy the nitrogen needs of the grass crop, that phosphorus would be over applied? 09:34AM

MR. BURNS: Object to form.

MS. COLLINS: Object to form.

A I haven't studied that.

Q So you don't know that?

A No. 09:34AM

Q Let's look again at Exhibit 1 that's in front of you and I'll ask you some questions about your report. Did you write the report in its entirety?

A Yes. It's my responsibility, and I wrote most of the verbiage. Anything that was added was under my direction. 09:35AM

Q And who else contributed to any of the verbiage that's contained in this report?

A Ken Kolm would have had some edits in here and Rick Ditmars would also have contributed. 09:35AM

Q Can you spell Rick Ditmars' name for the Record?

A D-I-T-M-A-R-S. They worked under my jurisdiction.

Q What areas would Mr. Kolm have contributed to in your report then, please? 09:35AM

A If you don't mind, perhaps I can explain to you how I did the report and then --

Q Let me just ask -- if you can just answer my question. Is there a particular area that Mr. Kolm contributed? 09:36AM

MS. COLLINS: Object to form.

A Well, after I'd written the first part of the report, the first iteration, I had Mr. Kolm go back in and check some of the numbers and do some further detailed analysis on the actual database. 09:36AM

Q All right. Let's talk about the detailed analysis. What did he look at in his detailed analysis of the database?

A I instructed him to QA/QC, the conclusions I had drawn, and to go back and check on the numbers in the database. 09:36AM

Q All right. Was he the only person then that did the QA/QC as you've described?

A In that fashion, yes. 09:36AM

Q And was there others who did so in a different fashion?
A Well, I did. For example, I found out that one of the concentrations was incorrect, didn't look right in the State's database or the Exponent database, so I inquired as to that particular problem, and we found an error in the databases that had been supplied to us. 09:37AM
Q And that was done prior to writing of your first report? 09:37AM
A No. That was in between the first report and the errata.
Q All right, and when did you discover that error?
A Oh, it would have been between those two reports. I don't recall exactly. 09:37AM
Q Well, give me your best guess because the first one is in January and the next one is in April. So there's quite a bit of time there. Can you tell me when it was? 09:37AM
A Might have been in the March time frame.
Q And would it be the first part of March or the end of March?
A I don't recall. Probably the first part of March I suppose. 09:37AM

Q What caused you in the first part of March to go in and look at the information again?
A Because we were looking at the information to just see how to prepare for deposition. We noticed this apparent error. We checked into it, and we found it was an error. 09:37AM
Q And do you recall which data entry that is that you were talking about?
A Yes. It's Site 22.
Q So it would be AR-22? 09:38AM
A Yes, and AR-26, 27 and 28, and we found that the point identified as 31, which appears anomalous, was actually a 0.031. So there had been a transcription error somewhere between the lab data and the database. 09:38AM
Q So the database you're referring to, is it the one that you took or is it the actual CDM database that the error occurs?
A I don't know. It was in the database we have that was provided to me off the site's website. So I don't know the exact genesis of the error, but we found the error, went back to the original lab sheets and found this was wrong, so we corrected it. 09:39AM
Q And you just realized that in March of this year; correct? 09:39AM

A That's correct.
Q All right, and does that same data point show up on the other sites, 26, 7 and 8, or are there different data entries that you were correcting?
A No. It shows up on all three of those. 09:39AM
Q All right. So it's the same single data point, just in three different sites or four different sites?
A That's correct.
Q All right. Back now to Ken Kolm contribution. 09:39AM
You talked about him doing QA/QC. What else did he do, and I'm talking about in reference to contributions to the written report that we see.
A That was about it.
Q All right. A Rich or Rick Ditmise (sic), tell 09:40AM me what contribution he made to your report.
A I asked him to do some quintile plots to look at sediment populations of phosphorus in the environment from the database, so he did that.
Q All right. So you didn't actually prepare 09:40AM those plots; he did?
A Under my direction.
Q Did he do anything else beside the QQ plots?
A No.
Q Does this report -- I'll ask you first on the 09:40AM

January portion of this report, does that report contain all of the opinions you're going to provide in this case?

A Well, that as modified by the errata you received. 09:41AM

Q Okay. I'm going ask you about the errata, but with regard to what I see in the January report, those are all the opinions you're going to make; correct?

A You mean in the actual summary of the opinions, that's correct. 09:41AM

Q There are no other changes to the text -- let me ask it this way and maybe it's easier. With regard to this January version and your now April version, are all of the changes to any opinions referenced in your errata? 09:41AM

A As far as I know at this juncture. If I find other errors moving forward, then obviously I'd reserve the right to modify opinions if there's a specific data point that changes. 09:41AM

Q Okay. Would you agree with me, sir, though, that based upon your errata, you're telling us that you've not made any changes in your opinions that were previously listed in your January report?

A Well, only in so much as one of the site 09:41AM

definitions has changed. So with the errata, consider that is the sum of my opinions, yes.

Q Okay. Are there any other opinions that you have formed that are not contained either in your report or in your errata? 09:42AM

A Not that I can think of at this point.

Q When did you first communicate to counsel that you had found errors in the first part of March to your original report?

A As I recall, it would have been March, but the errors were in the database for -- the errors in the database, for example, the 31 we talked? 09:42AM

Q You can start with that, yes, sir. When did you first -- you told me that's the one you found in the first part of March; correct? 09:42AM

A Correct.

Q All right, and when did you first notify counsel that that error was observed and you wanted to change your report?

A Well, that would be March I highlighted the issue because obviously a four-fold error in magnitude is something worth or three-fold error in magnitude is something worth noting. 09:43AM

Q When did you publish your errata and provide it to counsel in this case? 09:43AM

A I think it was last Thursday or Friday.
Q What took you so long to publish your errata from the time you learned of it in March?
A It was just -- what I was asked to do is provide errata sheets where I found them. One of the reasons was because I wanted to check on a couple of sites to look at drainage patterns, and so there's one site, for example, where it appears that drainage pattern was different than I'd originally assumed. 09:43AM
Q And you corrected that in your errata showing that that site drained to the east when you didn't think it did before; correct?
A I think that's correct, yes.
Q Were you the person that found the data entry errors or was it somebody working for you? 09:44AM
MS. COLLINS: Object to form.
A When you say data entry errors, what are you specifically talking about?
Q Well, you talked about that specific point, the 31 that was not listed correctly. 09:44AM
A Okay.
Q And you said you found that in early March.
A Yes.
Q Was it you that found it or was it someone 09:44AM

else working for?
A That was Ken Kolm working for me.
Q All right. When were you originally hired to perform work in this case?
A As I recall, it was October of 2008. 09:44AM
Q And did you sign a contract?
A I think there was a retention letter that was provided to you as part of my considered by documents.
Q And how much have you been paid in this case? 09:45AM
A I don't know, but the invoices have been provided to you as well.
Q Okay. We'll look at those later then. Did you provide all of the invoices?
A All the ones through when I was required to make the production, yes. 09:45AM
Q Did you do any work in this case that involved the preliminary injunction hearing that was conducted early in 2008?
A No. 09:45AM
Q All right. Let's look at Page 6 of your report, sir. In reference to Paragraph 8 on that page, it says that, and I'll quote, noted other anthropogenic features that potentially contribute to P -- or contribute P to the watershed in close 09:46AM

proximity to Cargill locations or between the Cargill location and sample sites. Tell me, if you would, sir, how were those anthropogenic features noted in your report?

A How were they noted? 09:46AM

Q Yeah. How did you actually make reference to them; can you give me an example of where that shows up?

A Yeah. If you look at Page 4, for example, halfway down it says the sources could include, but 09:46AM are not include limited to, septic systems, campgrounds, wastewater treatment plants, cattle, poultry, urban runoff, fertilized yards and golf courses, for example, and runoff from agricultural fields where phosphorus-containing pesticides and 09:46AM commercial fertilizers have been applied.

Q Okay. Let's go down that list then. I want to ask you about those. Establish for me and tell me, if you would, please, what data with regard to septic tank systems did you observe or look at in 09:47AM preparation for the statement given in Paragraph 8 of your opinions.

MS. COLLINS: Object to form.

A Well, if you look at a number of these locations along the Illinois River watershed rivers, 09:47AM

you can see there's houses and they're on septic systems, not POTWs, and so there's a possibility that houses having septic systems could discharge to the river system.

Q All right. Did you, sir, look at any data with regard to any of those septic systems in preparation of your report? 09:47AM

MS. COLLINS: Object to form.

A No, but I know septic systems can release over time. 09:47AM

Q Okay, and did you make an inventory of the number of septic systems that you observed?

A No.

Q Okay, and did you look for septic systems on April 1 and April 2 when you were in the watershed? 09:48AM

A I noticed some locations where it's likely they would have had septic systems that could have discharged in the river.

Q Would have and could have, but did you, sir, study any data that in fact showed they were? 09:48AM

MS. COLLINS: Object to form.

A Well, I noticed some of the phosphorus concentrations were anomalous, and in some cases there were higher phosphorus concentrations in the surface water directly adjacent to where there was 09:48AM

structures.
Q Structures meaning what?
A Houses or churches.
Q Would it include poultry barns?
MS. COLLINS: Object to form. 09:48AM
A Not in this case, no.
Q Did anybody for your report provide you numbers of septic tanks that are in the IRW?
A No.
Q Did you have available and review any literature with regard to whether septic tank systems in the IRW have a fail rate? 09:49AM
MS. COLLINS: Object to form.
A No.
Q Did you or anyone working on your behalf do a survey to determine if there had been any failed septic systems in the IRW for purposes of your report? 09:49AM
A No.
Q Did anyone else make any observations in the Illinois River watershed for you prior to your going to the watershed in April of this year? 09:49AM
A Yes.
Q Who was that?
A That was Ken Kolm. 09:50AM

Q And tell me what it is he did in the watershed generally.

A Generally there were a couple of sites that I wanted some more information about. So I directed him to go out to the watershed in January and look at those sites. 09:50AM

Q Okay. Do you recall which sites they were?

A As I recall, it was OK-01 and OK-02.

Q All right.

A Along with a couple of others. 09:50AM

Q Do you remember those?

A I believe they're are the ones with the 31 milligram per liter concentration.

Q That's the one you thought was in error and changed; is that what you're referring to or is it a different -- 09:50AM

A It was the one that we found the error in the database and changed on those -- that set.

Q What data or information did you have with regard to campgrounds being a source of anthropogenic phosphorus in the watershed? 09:51AM

A Well, I knew from my original research that there were campgrounds along the Illinois River watershed, and Dr. Kolm told me in fact he had confirmed that on his site visit in January. 09:51AM

Q Okay, and did he confirm whether or not there were facilities available at those campgrounds?

MS. COLLINS: Object to form.

A By facilities --

Q Meaning restroom facilities. 09:51AM

A Yes.

Q All right, and did he make any inspection of those restroom facilities?

MS. COLLINS: Object to form.

A Not as far as I'm aware. 09:51AM

Q I'm sorry, not as far what?

A Not as far as I'm aware.

Q Okay. Did he provide you any data or studies with regard to the potential of campgrounds to contribute phosphorus in the Illinois River 09:52AM watershed?

A No. He pointed out that there was half a dozen such facilities along the Illinois River.

Q Did you attempt yourself to quantify the potential source or volume of phosphorus 09:52AM contribution from that half a dozen sites?

MS. COLLINS: Object to form.

A No.

Q Okay. We have to take a break to change the tape and we'll be back as soon as five minutes or 09:52AM

so.

VIDEOGRAPHER: We are now off the Record. The time is 9:52 a.m.

(Following a short recess at 9:52 a.m., proceedings continued on the Record at 10:01 a.m.) 10:00AM

VIDEOGRAPHER: We are back on the Record. The time is 10:01 a.m.

Q Dr. Davis, we were talking about your other anthropogenic sources, and the next one on the list is wastewater treatment plants. Can you tell me 10:01AM whether or not you obtained any discharge rates from any wastewater treatment plants in the Illinois River watershed for your work?

A I reviewed some of the data in one of the other expert reports. 10:01AM

Q And whose report did you review?

A I believe it was Engel's.

Q And what data did you specifically look at; do you recall?

A I believe it was discharge rates from a series 10:01AM of POTWs.

Q Other than looking at Dr. Engel's report, did you obtain any other data with regard to wastewater treatment plant discharge rates as it relates to phosphorus? 10:02AM

A No.
Q Tell the court, if you would, please, sir, what data did you review regarding cattle in the Illinois River watershed and their contribution of phosphorus. 10:02AM
A Again, it was some reference to cattle in the Engel report as I recall.
Q All right. Other than the Engel report, did you look at or obtain any other data regarding cattle contribution of phosphorus in the watershed? 10:02AM
A Well, during my site visits I observed cattle crossings and noticed some cow pies in the river. That was a visual observation.
Q Okay, and how many such observations did you make? 10:02AM
A Oh, several different locations where there were cattle and there was bridges.
Q And would you agree with me, sir, that you did not know or have benefit of those observations at the time you wrote your report? 10:03AM
A Well, I knew it occurred, so --
Q Tell me, sir, how you knew it occurred at the time that you wrote your report.
A Well, I asked Ken Kolm to check and see if he would see that type of behavior in the IRW, and he 10:03AM

confirmed that, yes, there were cattle crossings and, yes, there were cattle in water.

Q And did he document that in any way?

A I believe in some of his photographs, yes.

Q And are those photographs supplied in your considered materials other than the ones we looked at this morning? 10:03AM

A I believe so.

Q And so other than the photos that Ken Kolm obtained for you at the time of your original report, is there any other data relied on besides that in Dr. Engel's report? 10:03AM

A Well, I know from general knowledge that's the case.

Q And how do you know from general knowledge that's the case? 10:04AM

A Well, over my 30 years of experience in looking at environmental matters.

Q Have you studied waste from cattle in any other case, sir? 10:04AM

A Not that I recall right now, no. I just happen to know that they frequent water bodies.

Q What data did you rely on with regard to urban runoff as a contribution of P in your report as other sources of anthropogenic features? 10:04AM

A Just general knowledge.
Q All right. You did not obtain any data in the IRW with regard to the population?
MS. COLLINS: Object to form.
Q The human population in the IRW? 10:04AM
A Well, again, I looked at reports that have been produced by the State, and I saw there was a population demographics, so --
Q Which reports did you look at?
A Again, I think it was the Engel report. 10:05AM
Q Anything else?
A Perhaps Fisher.
Q And Fisher?
A I'd have to go back and check.
Q All right. Any other reports did you look at, 10:05AM besides Engel and Fisher, regarding urban runoff data?
A No. That was the summary of it.
Q Did you review any land use cover maps in the IRW? 10:05AM
MS. COLLINS: Object to form.
A Just the locations where there are cities.
Q Well, do you know what a land use cover map is?
A Yes, in general terms. 10:05AM

Q Okay, and did you observe or study any land use cover maps for the IRW?

A No.

Q Did you, other than looking at Engel and Fisher's report, make any determination of the percentage of urbanization in the Illinois River watershed as opposed to agricultural use? 10:06AM

A Yes. On the map I provided, you can see where the towns are located in the IRW, and I could at least get a general idea about the population centers from that. 10:06AM

Q Did you quantify, sir, the percentage of urbanization versus the percentage of agricultural use in the Illinois River watershed?

A No. 10:06AM

Q The next one on your list were yards. What information or data did you rely on with regard to -- let me see if you used a particular -- fertilized yards' contribution of P in the watershed? 10:06AM

A Where it's just likely to occur as people fertilize their yard all the time to enhance grass growth.

Q Okay, and did you make any particular study or survey with regard to those growing yards in the 10:07AM

Illinois River, how much fertilization they used?
A No.
Q Did you look at any USDA records on fertilizer sales in the IRW?
A No. 10:07AM
Q Let's talk about golf courses. Tell me what was the source of your data relied upon for your report for the amount of golf course contribution of phosphorus in the watershed?
MS. COLLINS: Object to form. 10:07AM
A Well, I know generically golf courses use N, P, K to enhance the Bermuda grass, whatever. I had a site in Florida once where that had occurred.
Q Okay. My question is for the IRW, sir. I don't care about Florida. What do you know 10:08AM specifically about the use of fertilizers on golf courses in the IRW?
A I know I saw three golf courses at least when I was out there which were adjacent to the river. I don't know the specifics of fertilizer application, 10:08AM but my understanding is golf courses use fertilizers.
Q Okay, and do you know what kind of fertilizer they use?
A What brand name or -- 10:08AM

Q Is it commercial or poultry litter?
A As far as I know, it's not poultry litter. As far as I know, it's commercial. Usually it's a 10-10-10 NPK ratio or a 16-13-10 or whatever formula they elect to use. 10:08AM
Q How do you know they weren't using poultry waste on the watershed -- on the golf courses in the Illinois River watershed?
MS. COLLINS: Object to form.
A Because I believe they want to have smooth fairways and smooth greens, so I assume they wouldn't use poultry litter. 10:08AM
Q You're making an assumption, though. My question is how do you know whether they do or they don't?
MS. COLLINS: Object to.
A My understanding is they don't.
Q Okay, and your understanding is based upon an assumption; correct?
A That's correct. 10:09AM
Q Now, tell the court, if you would, please -- you talk about pesticides containing phosphorus. Tell me what pesticides are used in the IRW that contain phosphorus.
A I recall seeing a study where diazinon was 10:09AM

used in Arkansas and Oklahoma, and that was an issue for those states, and so those types of pesticides, I would assume, would be used where there was arable land.

Q Okay. You made that assumption that they were used. Did you -- have you made a determination what is the percentage of phosphorus contained in the fertilizer you just assumed was used? 10:09AM

A No.

Q Did you make any determination from any published data how much pesticide use is occurring in the IRW? 10:09AM

A Not as I recall right now.

Q Did you, for purposes of your opinions and your work in this case, review any mass balances on phosphorus for the Illinois River watershed? 10:10AM

MS. COLLINS: Object to form.

A I seem to recall that Fisher and/or Engel did something along those lines.

Q You seem to recall, but my question is, did you review it or did you just seem to recall seeing it? 10:10AM

A I saw it. I didn't quantitatively review it if that's what you mean.

Q All right. Did you quantitatively review any 10:10AM

other mass balance work for the Illinois River watershed?

A No.

Q Are you familiar with the mass balance performed by Dr. Marc Nelson at the University of Arkansas? 10:10AM

A No.

Q Did you at any time in preparation for your work and opinions in this case inquire as to Cargill how many birds they produced in the Illinois River watershed for any period of time? 10:11AM

A No.

Q Did you inquire of Cargill for your report or opinions given in your report as to the amount of poultry waste generated by the turkeys they raised in the Illinois River watershed? 10:11AM

MS. COLLINS: Object to form.

A No.

Q Did you inquire as to how much poultry waste is generated at a single grow-out facility of Cargill in the Illinois River watershed? 10:11AM

MS. COLLINS: Object to form.

A No.

Q Look at your Exhibit 1 and I want to direct your attention to your CV area of that report. Do 10:12AM

you have -- I guess where it starts your name at the top, director of Geochemistry, president. Is that where you are?

A Yes.

Q All right. I'd like for you to go through that and identify for me any particular entry on this CV that deals with the land-applied poultry waste. 10:13AM

A I don't believe there's anything in here that deals with land application of poultry waste, but that wasn't really my focus of my study. 10:13AM

Q Okay. Can you tell me, sir, are there any entries in your CV that deal specifically with any study conducted by you in the Illinois River watershed? 10:13AM

A I don't believe so.

Q All right. Can you tell me, sir, then, which of any studies deal with the fate and transport of phosphorus from fertilizer?

A Well, I've dealt with phosphorus before. 10:14AM

Q My question is specifically phosphorus from fertilizer. Is there anything in your CV that deals specifically with the fate and transport of phosphorus from fertilizer applications?

A Well, really you're narrowing the scope so 10:14AM

much because phosphorus is phosphorus, and so fertilizer is just a form of phosphorus, and I've got several studies in here that deal with phosphorus.

Q I'm going to get to those. I just want to quantify if there's any that deal specifically with land-applied fertilizers and the fate and transport of phosphorus from them. 10:15AM

A From fertilizers, no.

Q All right. Now, then, let's talk about the other sources of phosphorus that you've studied. Tell me which entry on your CV deals with the fate and transport of phosphorus. 10:15AM

A There is one on Page 3, the second entry from the top.

Q That's talking about the arsenic migration in phosphoric acid?

A Yes.

Q All right, and tell the court, if you would, what is the source of the phosphorus in the phosphoric acid that you reviewed? 10:15AM

A The phosphoric acid.

Q Okay, but what was the source of the phosphoric acid that you were studying?

A It was a constituent in styrene manufacturing. 10:15AM

Q Okay, and styrene is what?
A Is an organic compound.
Q All right, and that was in Carson, California?
A That's correct.
Q What time frame was that; do you remember? 10:16AM
A Oh, it was probably the 1990s.
Q And tell me generally what you did regarding the mechanism relating to arsenic migration with phosphoric in groundwater.
A Well, there the phosphate had got into the 10:16AM subsurface, and it out competed arsenic, which is in the form of arsenate, and so it preferentially bound soils kicking arsenic off and forming an arsenic groundwater plume.
Q Okay. So that was a matter of a chemical 10:16AM reaction then, and your real concern was arsenic in that case; is that true then?
A No. Real concern is both phosphate and arsenic.
Q Okay. What other studies, if any, did you 10:16AM conduct involving fate and transport of phosphorus?
A Well, it occurs quite often in several of these reports here, but you won't see it because it's an adjunct to the focus of the project. So, for example, in some of the bioavailability work 10:17AM

I've done, I've looked at phosphorus when it competes with soils for lead, but it won't necessarily be called out. For example, there's a paper that I was a co-author on, and it's on the top of Page 12, and you can see it was published in 10:17AM
Environmental Science and Technology in 1994, and it represented two to three years of work looking at the stability of lead phosphates in soils --

Q Okay.

A -- what happens if you add phosphate to those 10:18AM soils.

Q And were you dealing with groundwater there or surface waters?

A That was with the soils.

Q Just soils? 10:18AM

A Just soils, stabilizing lead in soils.

Q Okay. Any other areas where you've dealt with phosphorus, either surface runoff or groundwater fate and transport?

A Another one on Page 4. This is down in 10:18AM Pascagoula. Again, a question of looking at the stability of lead and what happens when atmospheric phosphorus is deposited on a port facility in this case.

Q That's the first one under the heading metals 10:18AM

specific?
A That's correct.
Q All right. Identify any others dealing with phosphorus runoff or fate and transport through either runoff or groundwater. 10:19AM
A Well, as I said, there are others in here that incorporate phosphorus, but I don't recall specifically as I sit here which one of those.
Q Well, let's narrow it. Can you just recall anything that dealt with the runoff from 10:19AM surface-applied or released chemicals that deal with phosphorus in your CV?
A I'd have to go back through each of these and check and see whether those are involved or not because there's one here in the Humboldt River, 10:20AM which I was looking at, that I may have had phosphorus as a constituent in that analysis, but I don't recall as I sit here today.
Q Okay, and it might have been here just because you might have sampled for a number of chemical 10:20AM elements, one of which might have been phosphorus, or was it that the real concern in the case that you're referring to?
A In that particular matter it was whether or not mining or feedlots were contributing anions to 10:20AM

the surface water of the Humboldt and looking at the mass balance of the Humboldt, but I don't recall specifically if phosphate was one of those constituents.

Q Show me where that entry would be in your CV. 10:20AM

A That's Page 6, left-hand side, second from the bottom.

Q Okay. Can you think of any other entries then that deals with phosphorus runoff from land-applied or released chemicals? 10:21AM

A I thought there was another one in here somewhere, but I can't see it right now as I'm going through this.

Q Would it have been the primary -- would phosphorus have been the primary constituent of 10:21AM concern in it or was it again maybe an adjunct as a result of a globalized sampling of many elements?

A No. It was the primary focus. You know, I've been looking at environmental chemistry for 30 years, and inevitably you see most of the elements 10:22AM over that period of time.

Q Did you -- any of your previous work include the specific --

A Oh, here it is. I just noticed it. Looking at Page 7, top on the left-hand side, and you can 10:22AM

see there we're looking at chlorinated and phosphorylated pesticides in Tifton, Georgia.

Q All right, and were they from land-applied chemicals or was this more of a soils groundwater study? 10:23AM

A It was a manufacturing facility. It was a groundwater and surface water runoff assessment.

Q Was it a point discharge or was it a non-point?

A That was a point discharge. 10:23AM

Q So that I'm clear, do any of your studies that you've listed or your work in your CV deal specifically with the process of surface transport of waste constituents from animal manure-applied fields? 10:24AM

A I think when you look at that narrow a focus, probably not.

Q All right. Have you and can you show me in your CV if there is any work specifically with regard to the study of the process of the transport 10:24AM through infiltration of waste constituents for animal manure-applied fields?

MS. COLLINS: Object to form.

A No, but I've done plenty of vadose zone studies. 10:24AM

Q And the vadose zone studies, did they deal with animal-applied waste?

MS. COLLINS: Object to form.

A Not specifically, no.

Q In your work with regard to any fate and transport of chemicals, is it important to know where the alleged contaminant may have come from? 10:24AM

MS. COLLINS: Object to the form.

A I don't understand the question.

Q Okay. If you're studying fate and transport, is it generally known what might be the source of a constituent of concern in order then to assess what needs to be done to stop it or repair the damage? 10:25AM

MS. COLLINS: Object to the form.

A Well, that's an extremely broad question. I suppose in this case I was looking at a receptor, being the Illinois River watershed, and trying to see whether or not the 34, 35 sources, the Cargill houses could reasonably be tied to the Illinois River watershed. 10:25AM 10:26AM

Q Generally speaking, sir, if you're dealing with a receptor such as a water body and you're trying to determine if it has been contaminated, don't you look to where the source may be?

MS. COLLINS: Object to form. 10:26AM

A Well, the first thing you do is establish what baseline conditions look like before you know if there's an impact.

Q Let's go ahead and talk about those. In establishing a baseline, what do you normally expect to do from a scientifically approved method? 10:26AM

A Well, that's what I attempted to do because as far as I can tell, the State hadn't collected baseline samples for sediments or surface water, so that's why I took the data and did my analysis to determine what an impacted population might look like above and beyond a baseline contribution from all of the various sources into the IRW. 10:26AM

Q Okay. Is a baseline that you're referring to, is that like a control or reference source? 10:27AM

MS. COLLINS: Object to form.

A No. Clearly there is a number of different contributions to the IRW, and I believe the State's experts have agreed to that theory, and so the question is what does a baseline look like and how do I identify what it looks like. So the baseline is composed of all those sources we've talked about, and as I did in my study, was to identify what that number might look like. 10:27AM

Q Well, maybe we're not talking about the same 10:27AM

terminology here, and we'll come back to it. Let me finish this other line I was working on because I will ask you some more about baseline. Is it fair to say that your work has been primarily in the area of mining and petrochemical contamination? 10:28AM

MS. COLLINS: Object to form.

A No. It's been a variety of different areas. I've looked at pesticide chemistry. You can see the various headings here. That's the sum of my body of work. 10:28AM

Q And I was asking you to give me a generalization. When I did look at it, my generalization is it looked like most of it involved mining and petrochemical contamination. Are you saying it's different? 10:28AM

A Yes.

Q What do you think is your primary area of expertise of concern in the past based upon your CV that we have here?

MS. COLLINS: Object to form. 10:29AM

A First of all, environmental work clearly as opposed to engineering. I've looked at hydrogeology, geochemistry of a wide variety of compounds in a wide variety of settings at a wide variety of different types of facilities. That's 10:29AM

how I view the body of work that I've undertaken in the last 30 years or so.

Q Okay. Did you, sir, determine the chemicals contained in poultry waste for purposes of rendering your opinions? 10:29AM

MS. COLLINS: Object to form.

A Yeah. I actually had a look at nitrate as well. We're talking about this earlier on, and I did a quick scan on a 10 milligram per liter threshold and looked at breakout of nitrates as 10:30AM well.

Q Let me ask you this, sir: Did you look at any published data with regard to the general constituents found and the percentages that are contained within poultry waste? 10:30AM

A Generally speaking, yes.

Q What was your source of information?

A I don't recall.

Q Okay. Did you, sir, make any determination whether the poultry waste generated from turkeys is 10:30AM any different significantly from that of broilers or chickens?

A I think there's a paper in my considered by documents that speaks to that.

Q And did you, sir, make any determination that 10:30AM

there was any significant difference in the turkey constituents in waste as opposed to a broiler chicken constituents in waste?

A If I recall correctly, there's a bit of difference in the binding by different constituents between turkey waste and chicken litter, but if I recall correctly, without having the document in front of me, the concentrations are not dissimilar. 10:31AM

Q So the concentrations were similar is what you're telling me, sir, in the poultry waste versus the broiler waste? 10:31AM

A Poultry waste versus turkey --

Q I'm sorry, turkey waste versus broiler waste if I misspoke. Those constituents are similar is what you said? 10:31AM

A That's correct.

Q All right. Have you, sir, undertaken any investigation or reviewed published literature to know if arsenic behaves similar to phosphorus in the soils in the IRW? 10:32AM

MS. COLLINS: Object to form.

A Well, it depends on the type of soil.

Q Did you determine what kind of types of soil are found generally in the IRW?

A Yes. 10:32AM

Q Okay, and with regard to your knowledge of those soils that you observed in your review, did you determine whether or not from published literature or your own investigation if arsenic behaves similar to what phosphorus does in the soils in the IRW? 10:32AM

A No.

Q And you're saying it does not or, no, you did not do that?

A I did not do that. 10:32AM

Q Thank you. Have you studied the fate and transport of organic carbon?

MS. COLLINS: Object to form.

A Yes.

Q And in what settings would that have occurred? 10:33AM

A In some of the sediment work I've done over the years.

Q And specifically what kind of work do you recall where you've actually done some sediment work investigating organic carbon? 10:33AM

A As I recall, looking at the partitioning of PAHs and PCBs and the presence of organic carbon and sediments and looking at the potential for bioavailability of those compounds.

Q And do you remember what kind of site 10:33AM

locations we're talking about, where they were?
A It would have been large river systems, such as the Lower Willamette in Portland, for example, some locations on the East Coast where I was looking at migration of organic compounds in sediments. 10:34AM
Q Okay. Given that you only had the database from CDM, did you make any determination in your own mind, sir, whether or not the waters in the Illinois River were elevated as to phosphorus?
MS. COLLINS: Object to form. 10:34AM
A Well, that was the -- I used the database. My objective was to compare and contrast what was going on throughout various areas of the watershed in relation to the Cargill properties.
Q I understand that, but generally speaking did you make a determination whether or not in fact the waters that had been sampled were generally elevated for phosphorus in the IRW? 10:34AM
MS. COLLINS: Object to form.
A That's too generic a question. In some places they were elevated and in other places they weren't. 10:35AM
Q Okay. Did you study any of the water samples from Lake Tenkiller or did you just look at the river and streams?
MS. COLLINS: Object to form. 10:35AM

A I looked at some of the data, but most of my focus was on the rivers and streams.

Q Okay. Did you find whether or not the data established elevated levels of phosphorus in the Lake Tenkiller? 10:35AM

A I think it depends where you sample. Some samples seem to be higher; some weren't.

Q Okay. As part of your examination for the Cargill sites, did you assume that poultry waste runs off and gets to the water? 10:35AM

MS. COLLINS: Object to form.

A I didn't make any assumption about that. I looked at the particular sites to see whether I thought that would be a possibility.

Q Okay. When you say you looked at it, you didn't physically look at it prior to writing your report in January, did you? 10:35AM

MS. COLLINS: Object to form.

A Not physically, but I understood what the ground surface was like, and I had Dr. Kolm's report of the general nature, the topography around these Cargill properties that he had looked at. 10:36AM

Q What's the basis of -- is it Mr. or Dr. Kolm?

A Dr. Kolm.

Q What was the basis of Dr. Kolm's topography 10:36AM

information provided to you other than the Google maps that we see in your work?

A He looked at potential runoff paths from the houses he was visiting. He noticed they were grassy. I told him to looks for reels and gullying. 10:36AM
I didn't see any of that occurring, and so there was no obvious transport mechanism at that juncture, which seemed to be supported by my analysis of the data collected by the State.

Q Did you observe that there were gravel roads leading up to the barns -- 10:36AM

A Yes.

Q -- down to bar ditches near the streets or road?

MS. COLLINS: Object to form. 10:37AM

A I know that there was gravel roads, yes.

Q Okay, and did you determine whether or not the gravel roads were a mechanism or pathway for travel of phosphorus or other waste constituents?

MS. COLLINS: Object to form. 10:37AM

A I was there when some of these gravel roads were quite wet, and there was a question of standing water because many of these houses were on the uplands where it's remarkably flat.

Q Did you observe water running down bar ditches 10:37AM

from edge of fields?

MS. COLLINS: Object to form.

A No. I saw water actually accumulating in the ditches and not migrating anywhere.

Q Okay, and that was when you were there April 1 and April 2? 10:37AM

A That's correct.

Q And did it rain on those days?

A It had been raining beforehand, and then driving back, I just noticed we were in the middle of a downpour, and I couldn't see any obvious runoff from the fields as we were driving by. 10:37AM

Q When you were driving back, specifically where were you when you made that observation?

A Somewhere in between Tulsa and the IRW. 10:38AM

Q So you could have been in Mayes County?

A Could have been.

Q Okay. Did you stop during that downpour and actually step out of the car and make any specific observations or were they made while you were traveling in a moving vehicle? 10:38AM

A It was raining so hard it would have been almost suicidal to get out.

Q So your answer is you didn't get out of the vehicle; correct? 10:38AM

A That's correct.
Q And the vehicle was still moving at the time?
A That's correct.
Q So let me make sure I'm clear. Are you providing an opinion that poultry waste, when land applied in the IRW, will not run off at any time?
MS. COLLINS: Object to form.
A No. I'm talking about the Cargill properties, and my assumptions are where the litter would have been placed on the Cargill properties, looking at the cause and effect in the Illinois River watershed to see if there's evidence that can tie the Cargill properties specifically to the data collected by the State. 10:39AM
Q So we're clear, I'm going to ask it again. Did you make any specific -- let me ask it again. Are you providing an opinion that poultry waste, when land applied in the IRW, will not run off at any time, yes or no? 10:39AM
MS. COLLINS: Object to form. 10:39AM
A Well, it depends where it's applied. So I can't answer the question. It's too generic.
Q So your answer is you don't know?
A That's correct, I don't know.
Q Okay, and you would agree with me that in 10:40AM

order to know whether that occurs, information such as topography would be necessary?

MS. COLLINS: Object to form.

Q Geology would be -- you can answer yes or no.

A Yes. 10:40AM

Q Geology would be necessary, yes or no?

MS. COLLINS: Object to form.

A Perhaps less so.

Q Hydrology would be necessary?

MS. COLLINS: Object to form. 10:40AM

A Yes, that's correct.

Q Rate of application would be necessary?

MS. COLLINS: Object to form.

A Well, depends -- there's two ways to look at this. You can look at the data that is collected 10:40AM and make an assertion about whether or not there's been a response to some source of phosphorus or else you can hypothesize, as has been done by the State, using models.

Now, my purpose was to look at the data to see 10:40AM whether or not there was a relation back to the Cargill houses, and so I didn't come up with a hypothetical analysis or a model analysis. I looked at the data and made a determination based on the data. So although it would be nice to know all 10:41AM

those things if you're doing a hypothetical evaluation, I used the data.

Q Would you agree with me, sir, that you used -- you yourself made no study from any specific site where land-applied poultry waste exists did or did not run off; is that a true statement? 10:41AM

MS. COLLINS: Object to form.

A No, because I looked at the Cargill properties.

Q I'm talking about Cargill properties. You made no specific study on any Cargill property to determine whether or not there is any runoff of poultry waste; correct? 10:41AM

MS. COLLINS: Object to form.

A That's not correct because I looked at whether or not there was a response in the State's database to the Cargill properties. 10:41AM

Q All right. Other than the State's database, did you, sir, undertake any scientific study or investigation to determine whether or not poultry waste would not run off any Cargill site? 10:42AM

MS. COLLINS: Object to form.

A Other than my observations, no, and my analysis of the topography and the proximity to the receiving waters. 10:42AM

Q And, again, you made no physical analysis yourself for your original report; correct?

MS. COLLINS: Object to form.

A What do you mean by physical analysis?

Q You didn't go there physically to the sites prior to your report in January for your observations? 10:42AM

MS. COLLINS: Object to form.

A No, but I sent Dr. Kolm to look at some of these sites for me. 10:42AM

Q And he took pictures for you; correct?

A That's correct.

Q Would you agree with me that elevation and topography sometimes is not accurately depicted with pictures? 10:42AM

MS. COLLINS: Object to form.

A No.

Q You don't agree with that?

A No. You can see where the swales are quite easily. I've had experience with photographs and 10:43AM aerial photography, and I had the Google Earth application so I could easily see what the topography looks like at these sites.

Q What other application, besides Google Earth, did you rely on in order to determine whether or not 10:43AM

land-applied poultry waste could run off the Cargill sites?

MS. COLLINS: Object to form.

A That was the tool I used for my initial evaluation. 10:43AM

Q I asked you what other tools did you use.

MS. COLLINS: Object to form.

A As I recall right now, that was the tool of choice.

Q All right. Do you know what the resolution is for the Google Earth? 10:43AM

A Well, it depends where you're looking. Sometimes it's extremely accurate and you can see a cow in the photographs. So the resolution of the size of a cow I think. 10:43AM

Q Okay, and how would you quantify that scientifically?

MS. COLLINS: Object to form.

A Well, I can see there's a cow in the picture and say, oh, can I see smaller objects? Well, probably not. So if it was a cow, it was probably six feet long, and I don't know, five feet high. 10:44AM

Q Could you in fact see cows in all aspects of the IRW where the Cargill sites were located?

A No, because it depends on when the photograph 10:44AM

is taken and whether the cows are out at that particular point in time.

Q Was it also dependent on the resolution, that in some areas of the IRW the resolution from Google Earth is not adequate to see a cow or distinguish a cow? 10:44AM

A That is true, especially in Oklahoma.

Q Did you have any direct contact with any Cargill company representatives other than this Tim you identified that you do not know the last name of in April of 2009? 10:44AM

A No.

Q When you talked to Tim, what did you discuss with him or let me ask you, did you discuss anything with Tim? 10:45AM

A I don't recall. What did we discuss? I asked him to help me orient myself when I was at the sites so I could depict the photographs accurately on the map. I don't recall. Just general conversation I suppose. 10:45AM

Q Did you obtain from Tim any specific Cargill data relative to the growing practices used by Cargill, growing practices of poultry?

MS. COLLINS: Object to form.

A Just generically about breeder houses and how 10:45AM

they were grown but --
Q Did you obtain any numbers of birds, how long birds are in the house, that kind of specific data?
A I seem to recall they spend eight weeks in one type of house, brooder houses, and then twelve weeks in another type of house, but that wasn't really the focus of my investigation, so it was just in passing. 10:46AM
Q Okay. Who made the decision to use the location of the poultry barns for your analysis? 10:46AM
A I don't understand the question.
Q Well, you've said you looked at the Cargill sites specifically and the adjoining land around it.
A Uh-huh.
Q Who made the decision to look at the site of the barn for your analysis? I mean, you've noted on your report -- every time we look at a photo, you've noted the location of the barns, have you not basically? 10:46AM
A Yes. 10:47AM
Q Who made the decision to make that as your focal point in your analysis?
A That was what I was asked to do by legal counsel.
Q Okay, and did -- who provided you the 10:47AM

locations of those sites for your analysis?
A I got those from Miss Collins.
Q Okay, and I think, if I'm not mistaken, there is a PDF of what appeared to be a spreadsheet that shows the lat-long and the name of a grower and maybe some other data; is that correct? 10:47AM
A That's correct.
Q And is that what you relied on; is that what you used to determine the sites of these barns?
A Yes. 10:47AM
Q All right. Do you know whether or not these barns have earthen floors or some other types of floors?
A I didn't go into the barns. I don't know.
Q Do you agree with me the barns, from what you've observed, have roofs on them; these are covered structures; correct? 10:48AM
A That's correct.
Q Did you or others for you inspect any actual poultry waste storage facilities at the Cargill locations? 10:48AM
A No.
Q So for purposes of your analysis, you assumed that the barn was the location for what would be the source of any contaminant when you compared it to 10:48AM

the State's database; is that correct?
MS. COLLINS: Object to form.
A Well, I don't believe these folks consider the phosphorus and nitrogen to be a contaminant. I think they believe it to be a source of fertility for the fields. 10:49AM
Q Let me ask the question this way: So for purpose of your analysis, you assumed that the barn was the location for what would be the source of the phosphorus when you compared it to the State's database; is that correct? 10:49AM
MS. COLLINS: Object to form.
A That area would be the location of the applied litter, yes.
Q All right. Did you observe, review or study any of the Oklahoma Department of Agriculture records for Cargill growers? 10:49AM
A No.
Q Did you review or study any nutrient management plans for Cargill growers? 10:49AM
A No.
Q Did you review or others for you review any poultry waste land application records for Cargill growers, including Cargill when I say Cargill?
MS. COLLINS: Object to form. 10:50AM

A No.

Q What records did you rely on that poultry waste was in fact land applied at or around the barns?

A That's the assumption I made for the purpose of the study. I had no other information. 10:50AM

Q Okay. That was going to be my next question. Did you discuss your assumption with anybody in the Cargill corporate representatives, not the lawyers but the corporate representatives? 10:50AM

MS. COLLINS: Object to form.

A No.

Q Did you discuss the assumption you made regarding the application sites with counsel for Cargill? 10:50AM

A Yes. I said that was the predicate for my work moving forward.

Q And did they approve that that would be the predicate for your work?

MS. COLLINS: Object to form. 10:51AM

A They didn't object to it. So I assume that was tasked assumption that they approved that.

Q All right. Other than the assumption you just described, did you do anything else to satisfy yourself where Cargill poultry waste was land 10:51AM

applied?

MS. COLLINS: Object to form.

A Well, as I said, I had no other information to reasonably assume they were taken anywhere else, and my understanding is it was used as a resource to actually facilitate grass growth. So I assume they want to do that as close as possible to minimize transport costs. 10:51AM

Q Okay. Did you discuss with any Cargill growers the length that they would transport poultry waste from the barn to the application sites? 10:51AM

A No.

Q So you don't know what distance the poultry waste, when removed from the barns, may be transported before it's applied; is that correct? 10:52AM

MS. COLLINS: Object to form.

A Well, that's correct. I assumed it would be proximal to the houses.

Q Did you inquire and determine whether or not the -- that all of the Cargill sites in fact land applied on location where the barns were with the immediately adjoining lands? 10:52AM

MS. COLLINS: Object to form.

A That was my assumption.

Q Okay, but you didn't make any specific inquiry 10:52AM

to determine if that assumption was accurate; correct?

A That's correct.

Q Okay. Did you ask anyone if they in fact land applied on their sites at all? 10:52AM

MS. COLLINS: Object to form.

A No.

Q Did you ask anyone if they sold their poultry waste to others who then land applied?

MS. COLLINS: Object to form. 10:53AM

A No.

Q Did you make any inquiry as to whether poultry waste from Cargill locations was transported outside the IRW?

MS. COLLINS: Object to form. 10:53AM

A No.

Q In your opinion is rainfall necessary in this case to provide a transport mechanism of the land-applied poultry waste?

MS. COLLINS: Object to form. 10:53AM

A It depends on where it is. We've had that conversation before.

Q Well, where would it need to be that rain wouldn't be necessary for the poultry waste constituents to transport? 10:54AM

MS. COLLINS: Object to form.
Q Transport to the water surfaces?
MS. COLLINS: Same objection.
A Well, it depends if there's grass that's going to prevent transport. Depends on the location. We talked about topography and all of those other elements. 10:54AM
Q If the rate of application for phosphorus for the grass exceeds agronomic rates, does having grass there matter with regard to whether it would transport or not? 10:54AM
MS. COLLINS: Object to form.
A Well, yes, because then you might have percolation of excess phosphorus down to the B horizon of the soil where it could precipitate out with the aluminum and the iron. 10:54AM
Q Okay. Could it also find its way to the groundwater, that is, the phosphorus find its way to the groundwater?
A Based on the data I've seen, I haven't seen much evidence of that. 10:55AM
Q And the data you've seen is solely the CDM database?
A That's correct.
Q Did you in your analysis obtain any historical 10:55AM

rainfall occurrences at or near the Cargill growing facilities in the IRW?

MS. COLLINS: Object to form.

A No.

Q Did you obtain any historical rainfall occurrences at or near the sampling sites used in the CDM database? 10:55AM

MS. COLLINS: Object to form.

A No.

Q We need to stop to replace the tape. Let's take a break and we'll come back. 10:55AM

VIDEOGRAPHER: We are now off the Record. The time is 10:56 a.m.

(Following a short recess at 10:56 a.m., proceedings continued on the Record at 11:07 a.m.)

VIDEOGRAPHER: We are back on the Record. The time is 11:07 a.m.

Q Dr. Davis, in your summary of opinions you say that there have been no site-by-site sampling campaigns and no loading computations to demonstrate that individual Cargill locations have affected surface waters. So that we're clear, there have been no water samples taken by you or your team for your opinions; correct? 11:07AM 11:07AM

A Yes. I just used the State's database.
Q Okay, and so I'm going to try and shorten it. So no soils, sediments, water samples obtained by you for study or your opinions; correct?
A That's correct. 11:07AM
Q There were no edge of field samplings conducted by your team?
A Nor by the State.
Q Huh?
A Nor by the State. 11:07AM
Q Okay. You're saying that the State did not have any edge of field samples?
A At the Cargill properties as far as I'm aware.
Q Okay, and you or your team did not conduct any geoprobe sampling anywhere? 11:08AM
A That's correct.
Q And when we talk about water, there's no sampling of any well water or other groundwater by you or your team; is that correct?
A That's right, and no spring samples either. 11:08AM
Q Thank you. Did you obtain any data with regard to flow rates of streams or the Illinois River for purposes of giving your opinion in this case?
A No. 11:08AM

Q Did you review any USGA flow rate data in this case?

MS. COLLINS: Object to form.

A No.

Q Did you observe whether the CDM samples were divided into base flow and high flow? 11:08AM

MS. COLLINS: Object to form.

A I know there was a set of Isco samplers set up, and some of the locations have got multiple samples collected over different periods of time, 11:09AM and I understand that in the statement of work that Dr. Olsen generated the goal was to collect samples from rising limbs and falling limbs of flood events.

Q Did you observe that there was in fact that data, that is, high flow and low flow data, in the 11:09AM State's database?

MS. COLLINS: Object to form.

A I haven't seen it correlate with flow. I know there's multiple chemistry samples collected over time. 11:10AM

Q Did you -- did you observe that samples were identified as being either high flow or low flow in the State's database?

MS. COLLINS: Object to form.

A As I understand it, that was at the three 11:10AM

locations, just upstream of Tenkiller Lake.
Q So at those locations only, are you telling me you did observe that there was high flow and low flow data in the State's database?
A I believe the objective was to collect those types of data from twelve different locations. 11:10AM
Q I'm asking you, sir, though, what you observed in the database, and what is -- and if in fact did you observe that the State's database contained descriptions that high flow and low flow samples were obtained? 11:10AM
MS. COLLINS: Object to form.
A I don't recall looking at the specific stage when the chemistry was collected, no.
Q So is your answer then that you did not observe that there were specific descriptions showing a sample being high flow as opposed to base flow? 11:11AM
MS. COLLINS: Object to form.
A I didn't specifically go back and check for that, no. 11:11AM
Q All right. Did you observe whether the samples were described as being filtered or non-filtered in the database that you worked with?
MS. COLLINS: Object to form. 11:11AM

A Yes, I'm aware there was filtered and non-filtered samples.

Q Did you observe if there was different testing techniques used for the soils, waters or sediments in the State's database? 11:11AM

MS. COLLINS: Object to form.

A Yes. There was a variety of types of phosphorus analyzed.

Q All right. For your work in this case, did you sort the sample database of the State in 11:12AM accordance with filtered, non-filtered, high or low flow?

A No. I took the average phosphorus where there was an average phosphorus concentration. The vast majority of samples were one location, one time, one 11:12AM concentration.

Q Did you ever attempt to plot every sample in the State's database for purposes of your work?

MS. COLLINS: Object to form.

A I'm not quite sure I understand what you're 11:12AM asking.

Q Well, you said earlier when we looked at a couple of views in your Google Earth aerials that there was a sample that was supposedly on there but wasn't shown. Was it because it was at the same 11:12AM

site or was it just a site so close in the Google aerial that it wasn't visible?

A Yes. As you pan in closer and closer, those samples separate out and that was the objective of the errata, to clearly show where there was multiple samples, what those concentrations looked like. 11:13AM

Q Did you plot then -- if at the same site there were multiple samples taken over a period, did you in fact plot all of the samples taken?

A I've seen on our database where we've gone back in and looked at replicate samples from the same locations over periods of time, and there's variability in the chemistry, and so sometimes it's high, sometimes it's low, depends on the season, depends on the flow rate I suppose, and so to simplify the exercise, I simply averaged those concentrations. 11:13AM

Q So in every case, you would have averaged -- let's say there was twelve samples at that particular location. You would have averaged those twelve samples each time for -- that's not a good question. For a single location where there were multiple samples, did you in fact average it? 11:14AM

MS. COLLINS: Object to form.

A Yes. 11:14AM

Q And did you do that for every location where there are multiple samples?
A For those few locations where that's the case, yes.
Q Did you also include every sample in your average when you would average them? 11:14AM
MS. COLLINS: Object to form.
A For some samples there was no data locate -- no location posted so obviously you wouldn't have looked at those. You wouldn't have looked at those samples because wouldn't know where they would have been. 11:14AM
Q Let me ask it this way: If you have a location and there are multiple samples, did you at any time remove a sample before doing an average? 11:14AM
A Not that I recall.
Q Did you observe in the State's database that samples were divided into categories by dissolved phase and particulate phase?
MS. COLLINS: Object to form. 11:15AM
A There was a variety of different descriptors for various types of analyses. It was more than just two.
Q Okay, but you agree you saw those two also?
A I saw dissolved, and I did see total I think, 11:15AM

yes.
Q Okay. What criteria did you use to determine if a sampling location was either upgradient or downgradient from a Cargill site?
A I looked at the physical features on Google Earth to determine where the tributary would enter the Illinois River watershed, and I looked at the location on northings-eastings of the samples to see how that related to where the Cargill house would potentially meet up -- where the tributary of a Cargill house would potentially meet up with the river. 11:15AM 11:16AM
Q Tell me -- the court reporter would like to know it, too. What is the term you used, northern eastings or something to that effect? I'm not sure I understood what you said and what that means. 11:16AM
A Northings and eastings is the same as latitude and longitude.
Q I'm sorry, I know what that means. I just didn't understand it when you said it the first time. I'll probably use lat-longs. 11:16AM
A That's fine.
Q So when I use that term, you'll understand it?
A If I use northings and eastings, that's what I'm used to, and you'll -- 11:17AM

Q How long has it been since you've been in America?

A Oh, 1976 I first encroached upon these shores.

Q You've been here since basically?

A Pretty much, yes. 11:17AM

Q All right. Did you use anything else, back to the original question, to determine whether a site is upgradient or downgradient other than what you've told me?

A Do you mean upstream or downstream or do you mean physically -- 11:17AM

Q Upgradient or downgradient. Did you do anything beside rely on Google Earth and your lat-longs to determine whether a site was upgradient or downgradient? 11:17AM

MS. COLLINS: Object to form.

A I'm not quite sure what you mean by upgradient or downgradient. From where?

Q From a sample site. Let's put it in perspective. And I agree. It's probably a bad question. From the sample sites you were comparing and in some instances I think you talk about what is upgradient or downgradient. I'm just trying to find out what tools, what criteria you relied on in order to make any determination whether a site or sample 11:18AM

location was up or downgradient from the other.
A I think I understand where you're coming from. It's a bit more complicated than that, though, because Cargill properties aren't on the main stem, and so what you have to do is -- or a tributary to the main stem, so what you have to do is see where the physical relationship between the Cargill property is to a feeder drainage and then make a determination where that feeder drainage accesses the creek or river and then see where the samples are in relation to that junction. 11:18AM 11:18AM
Q What tools did you use to do that?
A I used my knowledge of geomorphology, and I traced the tributaries to the streams to see where they intersected with the streams. 11:19AM
Q Okay. What tools did you use in order to apply your knowledge of geomorphology; what tools did you use, physical tools?
A I used Google Earth for that.
Q Anything else? 11:19AM
A Not that I recall right now.
Q When there were -- let's talk about two different instances. If we're looking at a sample site with a single data point and another sample site with a single data point, what did you -- did 11:20AM

you rely then solely on Google Earth to determine flow of the drainage area; is that what I understand you to say?

A Yes. I know how river systems work, so I could tell which direction the flow is going in the river system by looking at the orientation of the junctures between the receiving water and the tributary. 11:20AM

Q What kind of drainage system do you see in the Illinois River watershed; how would you describe it scientifically? 11:20AM

A I don't recall to be honest what the scientific term is, but clearly it's a series of waters coming together with a V shape, and so you can determine from the V shape which direction the flow is going. 11:21AM

Q Okay. So if you have two locations, sampling locations, one is upstream from a Cargill site and one is downstream from a Cargill site, if there are multiple samples at each of those sites, in every instance you would have averaged them to make your analysis? 11:21AM

MS. COLLINS: Object to form.

A Well, that wasn't the case, so -- I mean, normally it's just one sample. 11:21AM

Q All right.
A There may have been an occasional instance -- I think maybe three samples across the entire database I looked at where that was actually the case. 11:21AM
Q What was actually the case, that it was averaged?
A That there were multiple samples. Most of the time there was just one sample event for the vast majority. 11:21AM
Q In those instances where you observed multiple samples existing for that sample location, did you always average it?
MS. COLLINS: Object to form.
A Yes. 11:22AM
Q And so if those multiple samples were taken over a period of one year or more, you would have ignored the time frame by having averaged that sample; would you agree?
MS. COLLINS: Object to form. 11:22AM
A Yes. When I looked at the information, it was cyclical or up and down, and so I took the average, yes.
Q So if by taking the average, you've ignored the time frame and if you have a down slope or a 11:22AM

downstream sample location that the date of that sample is actually in time before any date in your average sample, how is that relevant --

MS. COLLINS: Object to form.

Q -- for your comparison purpose? 11:22AM

A I don't have the first understanding of what you said.

Q You don't?

A No.

Q Okay. Well, let's say if I take a sample upstream from a Cargill site and I take it on January 1, all right, and you rely on that sample and that data; correct? 11:22AM

MS. COLLINS: Object.

Q In your analysis that's what you would do; right? 11:23AM

A Right.

Q You look at the downstream, and what if the downstream data is one year preceding that; are those still relevant for purposes of your analysis? 11:23AM

A I don't know. It depends on looking at the information and seeing if that's relevant or not. I mean, I looked at the data as it was supplied to me, and I did the best I could to understand the spatial relationships between those data points that you're 11:23AM

talking about and see what the relationship looked like because it was all collected in the time frame of '05 and '06.

Q Wasn't there some '07 data also?

A Yeah, there may have been. So presumably I'd have had a sample that was collected in '05 upstream, for example, in your hypothesis, and then if there was a sample location downstream, there might be an '05 in subsequent samples collected. 11:23AM

Q I understand that, and I'm going to ask you my question again, and that is, what if you had a sample that was upstream in '06 and a downstream sample in '05; is that relevant for your analysis in this case? 11:24AM

A Well, yes. 11:24AM

Q How is it relevant?

A Because I'm still comparing concentrations downstream from a Cargill facility, and if there had been a contribution from the Cargill facility, there would still be -- and if this hypothesis of yours is correct that Cargill released to the river, then we'd still see a higher phosphorus concentration in '05. 11:24AM

Q Than that in '06 that was upstream?

A Well, '06, that would become just a basis. If 11:24AM

it's an upstream concentration that's lower as many of them might have been or there might have been another source for that if it was higher, then still reflecting what was going on at that particular point in time, yes. 11:25AM

Q Well, if those two points in time are months apart, you're telling me it's still relevant for your analysis?

A Yes.

Q Okay. You made no determination as to the flow rates in any streams or rivers in the Illinois River for your analysis; correct? 11:25AM

A That's correct. The information wasn't available from the State's database in the areas in which I was interested. 11:25AM

Q I'm sorry. Say that answer again.

A The information was not available on flow rates for the areas I was interested as far as I could determine.

Q But it is available through the USGS, is it not? 11:25AM

A Well, down near Lake Tenkiller and perhaps a couple of other stations, but that's way too broad of a picture to be able to understand what is happening at the local house level, if you will. 11:26AM

Q Okay, but you've testified, have you not, you don't know where the application of waste occurred; correct?

MS. COLLINS: Object to form.

A For the Cargill facilities, I assume it was proximal to the house. 11:26AM

Q Okay. If I were to tell you that many of the Cargill facilities have not land applied waste on their facilities in the last few years, would that change your opinion in this case? 11:26AM

MS. COLLINS: Object to form.

A Not necessarily, no.

Q So are you relying then on the phosphorus levels in the soil for a contribution determination?

MS. COLLINS: Object to form. 11:26AM

A I don't understand the question.

Q Well, if you don't know where the land-applied waste is occurring and if it's assuming it's not occurring at a site, a Cargill site, but is in fact occurring somewhere else, isn't your analysis for 11:27AM that particular site of no benefit?

MS. COLLINS: Object to form.

A Well, I don't know where the litter would have been applied other than the house. So I'd have to know that. Then I'd have to know what other 11:27AM

potential contributions of phosphorus were in the area.

Q Let's -- just let me give you a hypothetical then. Let's just assume that from this particular Cargill location, all the poultry waste in the time frame that you looked at in the State's data was land applied two miles away or five miles away from the site. Would that have any bearing on your opinion today if you then knew that? 11:27AM

MS. COLLINS: Object to form. 11:27AM

A Not necessarily. I'd have to go look at that particular location and see what the physical attributes were of that site and see what other potential contributors were in the area.

Q Okay, but as to the Cargill site, the opinion that you've given based upon an assumption that it was applied at that location, if that assumption is wrong, your opinion about that site may very well be wrong, too; correct? 11:28AM

MS. COLLINS: Object to form. 11:28AM

A No. My opinion about that site would certainly hold still because it wouldn't have released any releases from that site.

Q All right, because your opinion isn't there isn't any harm from any site from the Cargill 11:28AM

locations; correct?

MS. COLLINS: Object to form.

A No. My opinion is that there's no evidence of contribution to the surface waters of the Illinois River watershed based on the data that the State has collected from those specific locations. 11:28AM

Q All right, but you would agree with me, you don't know where it was applied and you've not undertaken an examination yourself to see if these other locations where it is in fact being applied has any effect on the Illinois River watershed; is that a correct statement? 11:28AM

MS. COLLINS: Object to form.

A I have no knowledge where it may have been applied other than the facilities. 11:29AM

Q Isn't it important to know where it's being applied in order to make some determination whether it's getting into the water in the Illinois River watershed?

A Well, as I said, I assumed it was applied adjacent to the facilities. 11:29AM

Q Other than your assumptions, sir, I know you've told me that several times and I know you've made that assumption, what I'm asking you, isn't it important to know where it's actually applied to 11:29AM

give an opinion whether or not Cargill poultry waste has had any effect in the Illinois River watershed?

MS. COLLINS: Object to form.

A Well, my opinion was very focused to particular locations where I understood that poultry waste to be applied. I haven't looked at other facilities or other areas outside of those 35 locations. So I can't really answer the question. 11:29AM

Q And so as a result of not having looked at those other locations, you don't know whether or not the poultry waste applied in those locations have in fact impacted the water quality in the Illinois River watershed; correct? 11:29AM

MS. COLLINS: Object to form.

A That's correct. 11:30AM

Q Okay.

A You'd have -- there's a multitude of issues you'd have to investigate to make that determination.

Q And did you investigate all the multitude of those issues for each and every Cargill site in doing your work today or in this case? 11:30AM

MS. COLLINS: Object to form.

A Yes. I looked at to try and understand what was going on in the area around the receiving waters 11:30AM

from the Cargill facility, if that was in fact the case.

Q So you're telling me today that you've looked at every issue of these multitude of issues you think are important for each and every site location for Cargill? 11:30AM

A No. I'm saying I've done an analysis of the 35 Cargill locations.

Q But didn't you say that analysis would require looking at a multitude of issues? 11:31AM

A Well, I have for the locations. I've tried to understand what is the situation in relation to the State's database where that water is coming in or may be coming in from the Cargill properties.

Q Is it important to know -- let's just go with your assumption assuming there has been waste applied on a Cargill location, and would it be important to know when rainfall might have occurred at that site as to know whether that samples would reflect in fact if poultry waste is getting into the water? 11:31AM

MS. COLLINS: Object to form.

A No. I think the important thing is to look at the State's data, look at the database and see if there's an unambiguous evidence that in fact a 11:31AM

particular poultry house has been impacting the river.

Q And your analysis comes from a very small drainage area from each site; is that a fair statement? 11:32AM

MS. COLLINS: Object to form.

A For the most part, but the data that's been collected should reflect what's going on in those drainages.

Q And to the extent that there is some contribution that may not be measured as close to the site as the samples you've reviewed, would there not be a possibility of cumulative effect further downstream that you've not looked at? 11:32AM

MS. COLLINS: Object to form. 11:32AM

A Well, for example, one of the sites was a state sample eleven miles downstream from the Cargill house, and I don't see how you can possibly make any inferences from a site sample that's being collected that far down from the potential source. 11:32AM

Q How many sites were in the drainage area of that eleven miles downstream?

A I believe it was just one, but I'd have to go back and refresh my memory.

Q Okay. If there are -- but you expand this and 11:33AM

look at a larger watershed basis, even if it's a subbasin and there are multiple Cargill houses in the subbasin, how do you know whether or not there's some cumulative effect of the land application with turkey waste and that of broiler waste? 11:33AM

MS. COLLINS: Object to form.

A Well, I looked at the data to see if in fact the first downstream dataset supported that hypothesis, and I decided that it didn't based on my analysis. 11:33AM

Q And that's -- and part of your analysis is based on the fact you don't know when it was applied; correct? Correct?

MS. COLLINS: Object to form.

Q Your analysis does not tell you when the waste was applied? 11:33AM

A I know it's been applied in the last few years generically.

Q Okay, and you don't -- and you didn't observe or look at any rainfall data to know when those events have occurred relative to an application; correct? 11:34AM

A That's correct.

Q Okay, and you've done nothing to study the groundwater flow of any leachate of poultry waste, 11:34AM

have you?
A Yes. I generally know that it flows to southwest of groundwater, and I've looked at the groundwater samples in the State's database when it's proximal to the Cargill locations. 11:34AM
Q And did you study the faults and fractures at each of the site locations to know exactly where the groundwater flow is?
A No. I'm assuming the State put their wells in the places where they thought would best represent 11:34AM the potential groundwater flow from these sites.
Q Okay. Do you know whether or not the State was in fact targeting specifically Cargill sites?
A I don't know.
Q If you're looking at a sample that is a day 11:34AM before a rainfall event, would that necessarily reflect the runoff from that rainfall event?
MS. COLLINS: Object to form.
A Sample of what? Edge of field or --
Q Sample of a nearby water resource. 11:35AM
A I don't know.
Q Okay. So is it even possible that a sample taken a day before a rainfall event would have any effect from that subsequent rainfall event?
MS. COLLINS: Object to form. 11:36AM

A I just used the data that was in the database. I can't really talk about hypotheticals. So I used the data in the database to see in my opinion if the State had made a valid showing that the Cargill locations had impacted the IRW. As I said before, I didn't find that causal response in the data, so that's what I've got to go on. Everything else is hypothetical. It's just the data.

Q But you've agreed with me that you've averaged multiple samples when they were available, and those could be over a period of a year; correct? 11:36AM

A But that's in a very -- in one or two instances. If you look at the dataset as a whole, that's not the case.

Q So for purposes of your analysis, the time at which the sample was taken is really not of importance to you; correct? 11:36AM

A I just used the data that was available in the database, and I assumed that I looked for cause and effect in the database. That's all I can do. 11:37AM

Q And as part of that cause and effect, did you take into consideration the timing of any of the samples shown in the database?

A Well, yeah, insomuch as they're being collected over a period of three or four years, and 11:37AM

this process has been going on for many more years than that, so I would expect if there was a chronic release from a particular location, you would see it in the database, either in the sediment or the surface water. 11:37AM

Q What was the authority that you used to limit your sample focus -- let me restate that. What was the authority you used to limit your focus on the samples to within the two-mile radius?

A I believe some reference in Engel or Fisher about distribution of litter, but I really focused on the nearest proximal sample to the particular facility. 11:38AM

Q If you don't know where the land application is occurring, how is it you can limit it to a two-mile radius? 11:38AM

MS. COLLINS: Object to form.

A Well, as I said, I assumed it was actually at the facility.

Q Did you make any inquiry to determine whether or not a different integrator -- I'm sorry. Let me rephrase it. Did you make any determination to know whether or not a different grower's poultry waste was being land applied on any of the Cargill sites? 11:38AM

MS. COLLINS: Object to form. 11:39AM

A Do you mean they imported litter?
Q Pardon me?
A Do you mean they imported litter?
Q No. I'm talking about some other litter source within the watershed was land applied on the Cargill facility sites. 11:39AM
A No.
Q Is it true that you did not examine or consider the effect of fractured flows from infiltration in your analysis? 11:39AM
MS. COLLINS: Object to form.
A I don't think that's particularly relevant to the analysis.
Q So your answer is that you did not consider the effect of fractured flows from infiltration? 11:40AM
A That's correct. I don't think it's relevant.
Q Did you -- do you agree that phosphorus in water and sediments can be impacted from groundwater?
A Well, depends what the nature of the local hydrogeomorphological setting is. 11:40AM
Q And if all those settings are correct, do you agree, sir, that phosphorus in the water and sediments can be impacted from groundwater?
MS. COLLINS: Object to form. 11:40AM

A I don't know. I haven't studied that.
Q Do you agree that you have ignored any groundwater contamination that would contribute to the levels of P in the water in sediments?
MS. COLLINS: Object to form. 11:41AM
A No.
Q And how did you consider the groundwater contamination as a possible contributor to the levels of phosphorus in the water and sediments?
MS. COLLINS: Object to form. 11:41AM
A Wherever the State had collected groundwater data in the vicinity of the Cargill houses, I inspected that data to see if it was reasonable that phosphorus levels were above what might be considered a natural background concentration in 11:41AM those wells. I didn't find any cases where that was the -- appeared to be the effect.
Q What was the background level you relied on then in that instance?
A I seem to recall I was looking right at about 11:41AM 10 parts per billion.
COURT REPORTER: Billion?
A Billion.
Q And that was in soil or water or sediment; what was your -- 11:42AM

A That would be in groundwater. We'd have to look at specific locations where that actually was -- there was actually groundwater data.

Q Okay. Are you familiar with the term baseline as it's used in natural resource damages under CERCLA? 11:42AM

A Yes.

Q And you used the term baseline in your report. Are you intending to mean the same as it's used in CERCLA for natural resource damages? 11:42AM

A No.

Q All right.

A At least I don't think so. My -- my interpretation of baseline in here is that it's the sum of natural background contributions from populated areas, for example. 11:42AM

Q What if those background levels are already elevated from contribution from Cargill land-applied poultry waste; you wouldn't know that, would you, from what analysis you've taken? 11:43AM

MS. COLLINS: Object to form.

A Well, if you look at the drainages, typically 30 to 50 parts per billion seems to be a baseline condition in most of these streams in the vicinity of populated areas. So I would proffer that as some 11:43AM

type of background, if you will.
Q Did you make any determination as to what the background is for unimpacted soils that are similar in nature to what you find in the Illinois River watershed? 11:43AM
A Yeah. I looked at the concentrations in the database. I don't recall specifically what those numbers were, but I have them in some of the plots I've shown in my report.
Q Did you make any determination yourself as to 11:43AM the background levels for surface waters that are unimpacted by poultry waste?
A Well, I looked at the distribution of surface waters, and there is no way to really cull out a particular concentration that's background, if you 11:44AM will. It depends on what the potential sources might look like, and what I said just now was the aggregate seems to be about 30 to 50 parts per billion from background conditions.
Q Did you make any determinations, sir, as to 11:44AM the background for sediments, for unimpacted sediments?
A Yes.
Q And what did you do to determine that?
A I looked at the sediment populations in the 11:44AM

database and I looked -- I asked my statistician to generate some histograms of those populations. It turned out there's more than one. So when I saw that, I instructed him to do the quintile-quintile plot and see what the -- it was a very common statistical analysis, and see what the cutoff might look like that describes the baseline population versus an impacted population.

Q Did you include in that analysis the reference samples gathered by the State of Oklahoma from unimpacted soils and sediments for water? 11:45AM

MS. COLLINS: Object to form.

A Well, I didn't use any soil data.

Q Okay.

A It was just sediment data. 11:45AM

Q Sediment data, all right. Did you include the referenced sediment data collected by the State of Oklahoma?

A I think there was two or three samples in there, yes. 11:46AM

Q And you included them in your analysis then?

A As I recall, yes.

Q And why would you do that if you're trying to find a background?

A Because they're part of the population. 11:46AM

Q What if that population is not in the IRW, that the reference was in fact taken outside the watershed; would that make any difference?

A No, not at all.

Q Looking at Page 3 on your report, is that chart described as a probability chart or is it a frequency chart? 11:46AM

A Well, I call it a histogram.

Q Okay. Is it charting probabilities or frequency? 11:46AM

A That one is probabilities, but that's the same as frequency for all intents and purposes.

Q So you're showing frequencies of samples on the Y axis; is that correct?

A That's correct, obviously corrected for the actual number of total samples because you've got probability. 11:47AM

Q Did you determine what the mean was in the data shown in this Chart 3 -- I'm sorry, the chart on Page 3 -- it's not Chart 3 -- Figure 1? 11:47AM

A Yes. The analysis here says 312 parts per million.

Q Do you agree that that mean that's in the lower population is actually elevated?

MS. COLLINS: Object to form. 11:47AM

A Elevated compared to what?
Q To what you're seeing here.
A That question didn't make any sense.
Q Okay, good. Do you agree that the mean of 312 milligrams per kilogram is elevated in relation to the background samples? 11:48AM
MS. COLLINS: Object to form.
A No. This is the baseline population here. So it's the accumulated contributions from whatever would be considered in baseline. So this whole population would be, quote, background. It's not true background because this is a populated watershed. True background might be one number, but what we have to understand is what the baseline looks like to determine whether or not there's incremental impacts from other sources. 11:48AM
Q Okay. You list here an elevated population on this chart, do you not?
A Yes.
Q And why do you depict the elevated population is at 600 when you use 460 milligrams as your screening criteria? 11:49AM
A Because 600 is more or less in this particular rendition where the two populations cross over, and so below 600 there would be some baseline 11:49AM

participants and some which would represent the elevated population, and so the 600 number is the number you could use as a baseline upper limit, if you like, in this analysis.

Q Let's get back on this because I think I'm a little bit confused by why you used the term baseline, and baseline in the terminology that I'm used to seeing is it's the condition or conditions that would have existed at the assessment area had the discharge or release not occurred. Do you agree with that definition? 11:49AM 11:50AM

A No. I think you're talking about -- when you say release, you're talking about any release?

Q Yes. I'm talking about phosphorus in this case. 11:50AM

A No. I'm talking about that's background. That's a pristine pre-Columbian type of environments where there's no population. That's what you're talking about there as background.

Q Well, for environmental science when we're establishing background, though, there is some background that even though there is some relationship to contributions post, pre-Columbia or whatever it is you want to use as your time period, there is some background that is used and could be 11:50AM 11:51AM

used for the Illinois River watershed as essentially an unimpacted level of sediments, is there not?

MS. COLLINS: Object to form.

A Not that I know. I don't know where it is.

Q Okay, and you've not --

A This is a populated area, so how can you have a background? That's not possible here with the data we've got.

Q And -- well, isn't it fairly common in a scientific analysis to go out and find an area that is generally unimpacted from the constituent of concern in order to measure that against the level of contamination that's seen at the assessment area? 11:51AM

MS. COLLINS: Object to form.

A It depends where you are. I mean, I've certainly undertaken background studies in Nevada in non-mineralized areas, for example, when I'm trying to compare the effects of mineralization versus non-mineralized areas. But here in this particular setting, it's not reasonable to do because the whole area has been impacted by human populations for centuries. So that's why I've separated background from baseline. 11:51AM 11:52AM

Q And isn't the numbers that you're using to establish your baseline from sediments that have 11:52AM

been impacted for decades from continuous poultry waste application in the IRW?

MS. COLLINS: Object to form.

A It's been impacted by a wide variety of contributions. 11:52AM

Q Just answer my question. Has it been impacted by poultry waste over decades in the IRW?

MS. COLLINS: Object to form.

Q Yes or no?

A I don't know. I don't think you can tease that out from this dataset. I -- what you can say is there's a variety of different contributions to the IRW, and that's what this representation shows is discriminating between the baseline contribution and the impacted population. That's what baseline looks like. 11:52AM

Q But don't you agree with me, sir -- let's look at the chart on the next page where you pick an arbitrary number of a cross line of 460 milligrams per kilogram, do you see that, and that's what you've used as your screening tool; correct? 11:53AM

MS. COLLINS: Object to form.

A It's not arbitrary.

Q Isn't your screening tool at 460 milligrams where you've crossed the lines on that chart? 11:53AM

A That is the concentration where below that concentration it is baseline population and above that it's the impacted population.

Q All right. Is it your testimony, sir, under oath that from the level of where you would cross a line at 200 milligrams per kilogram, that from 200 to 460 none of that is impacted by phosphorus from land-applied poultry waste? 11:53AM

MS. COLLINS: Object to form.

A I'm not quite sure what 200 has to do with this but I can't -- 11:53AM

Q It's a number I'm picking, sir.

A Okay. I can't tell what's impacted below 460.

Q All right.

A I think this is a wide variety, as we've pointed out already, and had this discussion of potential contributions to the watershed. 11:54AM

Q Do you agree with me, sir, that between 200 and 460 you can't tell but there is in fact some contamination existing in some degree between the 200 level and the 460 level you've used for a screening tool? 11:54AM

MS. COLLINS: Object to form.

A It's possible, but I don't know.

Q You make a statement in your report on Page 4 11:54AM

that concentrations above 460 milligrams per kilogram do not necessarily indicate a problem. Tell me what is your basis of authority for that statement.

A It's not a standard. It's simply saying there -- it does not represent a risk assessment, if you will, where I've done a risk assessment and said a particular number is a potential concentration of concern, but it's clearly where there is a shift in the population, and you can see incredible concentrations that don't form to the baseline population. 11:54AM 11:55AM

Q What is the basis of authority for your statement, concentrations above 460 milligrams per kilogram do not necessarily indicate a problem? 11:55AM

MS. COLLINS: Object to form, asked and answered.

A I just answered that.

Q Can you give me the authority on which you rely? 11:55AM

A Yes. My analysis.

Q And that's it?

A I've been doing this type of thing for decades, yes.

Q Okay. Do you agree or not agree that there is 11:55AM

contamination in the samples below your 460 milligrams per kilogram that you've picked?

MS. COLLINS: Object to form.

A There is levels of phosphorus that have contributed to the sediments from a variety of different sources. 11:56AM

Q So your answer is, yes, there is?

MS. COLLINS: Object to form.

A I don't know if one would construe it as contamination or not. 11:56AM

Q So, therefore, you are not making an opinion in this case that below 460, it is or isn't contaminated; is that what I'm hearing you say?

MS. COLLINS: Object to form.

A I'm not making a judgment about the risk assessment perspective. 11:56AM

Q Okay, and is that also true then for any levels above 460 milligrams per kilogram, that you're not making a judgment there either?

MS. COLLINS: Object to form. 11:56AM

A That's correct. I'm just saying you don't know if there's an impact from a risk assessment perspective or not.

Q Do you know where control samples were taken by the State of Oklahoma? 11:56AM

A I think they were taken off, as I recall, somewhere to the northwest of the IRW.
Q Is it your opinion that there's only been one location for control samples taken?
A I think there was two or three, but I'd have to go back to the database and confirm that. 11:57AM
Q Do you have any scientific data in which to dispute the correctness of the choice of the sediments as control samples used by the State?
A I don't have any knowledge to either corroborate nor to disavow the locations. 11:57AM
Q Do you have any scientific data which dispute the accuracy of the sediments control samples used by the State?
A Do you mean the concentrations? 11:57AM
Q That would be part of the accuracy, yes, sir. That's how they're measured, aren't they?
MS. COLLINS: Object to form.
Q Aren't they measured in concentration?
A Well, your question was vague. I was trying to confirm actually what you were talking about. 11:58AM
Q Are they measured in any other way than concentration in the database that you've looked at?
MS. COLLINS: Object to form.
A Not in the database I've looked at. 11:58AM

Q Okay. So --
A What I'm saying is your question was vague, and so I was trying to confirm what it was you wanted me to address.
Q Okay. Do you have any scientific data to dispute the accuracy of the samples that are the sediment controls used by the State? 11:58AM
MS. COLLINS: Object to form.
A Not from a concentration analytical perspective, no. 11:58AM
Q Do you have a scientific data to dispute it in any other way?
MS. COLLINS: Object to form.
A Well, I don't know if it's completely relevant to the Illinois River watershed because they were collected outside of the watershed, and I don't know if that area is a good proxy for the Illinois River watershed baseline conditions. 11:58AM
Q So your answer is, yes, you don't have any information to dispute the accuracy of those samples; correct? 11:58AM
MS. COLLINS: Object to form.
A I think I just told you what my misgivings were about those samples.
Q But that isn't the answer to my question. My 11:59AM

question to you is, do you have any scientific data that would dispute the accuracy of the samples taken and used by the State for their background?

A Not at a specific time, no.

Q Do you agree that there can be degrees or levels of contamination found in the IRW? 11:59AM

MS. COLLINS: Object to form.

A Well, I think that's true -- well, when you say contamination, there's different concentrations of phosphorus in different locations. So if that's what you mean, yes. 11:59AM

Q And would you agree then that in that instance, higher levels of phosphorus would indicate greater impact from phosphorus or not?

MS. COLLINS: Object to form. 11:59AM

A Yes. If it's higher phosphorus concentrations, then there is a higher phosphorus concentration.

Q Since looking at your chart, Figure 2 on Page 4, you can't determine whether there is contamination above or below your 460 line. Do you agree that there is not necessarily a single line that when it's crossed, you can conclude contamination exists for poultry phosphorus? 12:00PM

MS. COLLINS: Object to form, misstates 12:00PM

testimony.
A Well, there's two populations here. There's an impacted population and a baseline population. I'm not sure how else to --
Q Then is it your -- is it your testimony that the only impacted population is that which is above 460 milligrams per kilogram? 12:00PM
A Yes. The rest is baseline, but it's been impacted. The baseline population has been impacted by all those other contributions that we talked about earlier. 12:01PM
Q And that analysis -- your decision that you just told me is based upon what you've constructed or somebody for you on the chart Figure 2 at Page 4; correct? 12:01PM
A That's correct.
Q Okay. Is it possible that samples above 300 on your Figure 2 up to 460 have some phosphorus contamination in them?
MS. COLLINS: Object to form. 12:01PM
A Well, yes, because this is a phosphorus concentration plot.
Q Did you do anything to determine a representative background sample for either soil, water or sediments in the IRW? 12:02PM

A Yes. I did this analysis for the sediment to evaluate what my opinion of baseline is because I don't believe you can determine background the way you've described it.

Q Let's take a break and let him change the tape and we'll come right back, if you would, please? 12:02PM

VIDEOGRAPHER: We're now off the Record. The time is 12:03 p.m.

(Following a lunch recess at 12:03 p.m., proceedings continued on the Record at 1:09 p.m.)

VIDEOGRAPHER: We are now back on the Record. The time is 1:09 p.m.

Q All right. Dr. Davis, you said earlier that the baseline in your chart there is impacted. Does that include being impacted from land-applied poultry waste or any other -- just let's stop there. Does that included impacted from land-applied poultry waste? 01:09PM

MR. BURNS: Object to form. 01:09PM

A It includes anything that's identified on Page 4.

Q Okay. Which includes land-applied poultry waste; correct?

A And you can't separate out what those 01:09PM

contributions look like and you don't know if a particular --

Q Well, you haven't done that, let's put it that way; correct?

A That's correct. 01:09PM

Q All right. Now, so that I can understand on your baseline calculation here, if you -- or as more phosphorus is added to the watershed from where you've measured it and created your chart, Figure 2, does your screening tool level change also? 01:10PM

MS. COLLINS: Object to form.

A I don't understand the question. It's based purely on just the data of the population that was available for this particular analysis.

Q All right, and I understand that you've limited it to just that, but in theory, if the data that is used has a continued period of time where phosphorus is continually added to the watershed, will that cause the level of your screening tool that you've chosen here to also change? 01:10PM

MS. COLLINS: Object to form.

A Well, this is a snapshot in time using the data that's available. So I don't know what might happen in the future, and I don't know what the condition was in the past. 01:10PM

Q And so if the conditions in the past were less concentration of phosphorus, would you agree that your screening tool of 460 milligrams per kilogram would likely go down also?

MS. COLLINS: Object to form. 01:11PM

A This approach here is only specific to this particular point in time with this particular dataset.

Q Okay. Let me hand you what I've marked as Exhibit 14, and this is from your spreadsheet Davis 00739-P total Sed depth. I've put that down in the lower right-hand corner of this particular exhibit, but I've sorted it by location. Did you look at the descriptions for identifying the samples as they are listed in this dataset? 01:11PM 01:12PM

A For this particular analysis here?

Q Did you look -- at your dataset, did you look at what these descriptions are on Exhibit 14 as set out in the CDM materials?

A For this one I just used the entire dataset as it's portrayed here. 01:12PM

Q And I understand that, but my question is, did you look at the descriptions to identify what they stand for under the column location in the dataset when you did this work? 01:12PM

A No, not when I did this work.
Q Okay. Looking at the Exhibit 14 and the description at the very top under location, do you see the BBL and what looks like five samples there with descriptor BBL? 01:12PM
A Yes.
Q And you don't know where that location is, do you?
A Well, not without going to the database, no.
Q And what you just told me is that you didn't do that in preparation of your work in this case; correct? 01:13PM
A For this particular report, that's right.
Q All right. Did you do it for any other report besides the one that you just pointed to as Exhibit 1? 01:13PM
A Yes.
Q And what did you do it for?
A Well, I've subsequently gone back and looked in the dataset and noticed there was some data that you could take out or you can leave in depending on your particular preference. 01:13PM
Q And all of that resulted in your errata that we received yesterday afternoon; correct?
A Not completely. 01:13PM

Q All right. There are more changes then do you expect to make in your report?

A There's one specific to this particular issue that I think sheds some more light on the distribution of the data, yes. 01:13PM

Q And have you put it in your errata already?

A No.

Q And are you intending to have another submission or a change in your report?

A Could I have those sheets, please? Thank you. 01:13PM This data is the same as here, but I sensed it to remove what I noticed over the weekend included some duplicates that seem to be the same number and also some lake samples. So as you can see, once you take out the duplicates and the lake samples, the 01:14PM concentration of the baseline versus impacted actually goes up to about 418 milligrams per kilogram. So quite similar to the previous list.

Q All right. Let's get back to my Exhibit 14 then, and I'll come back to this? 01:14PM

A Okay.

Q But I want to complete my questioning on Exhibit 14. Do you know where BBL location is?

A Not as I sit here today, no.

Q Okay. Do you know whether it's even in the 01:15PM

IRW?

A That could be the background samples, but I don't know.

Q Okay. There's another partway down that says BS-REF. Do you know where that location was? 01:15PM

A Not specifically, no.

Q Do you know whether it was in the IRW?

A Not without going back to the database.

Q All right. Did you know it at the time you prepared your chart on Page 4? 01:15PM

A No.

Q Would you look at the last page of Exhibit 14, please, and there's -- under location column the very -- near the last SLK 1 through 4. Do you see that one? 01:15PM

A I see those, yes.

Q And do you know where that location was?

A No.

Q And did you know it at the time you prepared your report? 01:15PM

A No, but I would like to point out, it would have absolutely no impact whether those samples are included or excluded on the analysis.

Q And why is that?

A Because if you look, you can see they fall 01:16PM

within the range of 180 or thereabouts. Those are varied in this last set. In the first set they're between 220 and 300, and so it would have essentially the effect of removing a few of these data points, and when one removes a number of these data points, there's no significant change in the outcome of the analysis.

Q And the analysis you're referring to is the calculation made in Figure 2 or your opinions? 01:16PM

A To both. 01:16PM

Q Okay. So even if those -- even that data was outside the IRW, having it in has no impact in your opinion?

A That's correct.

Q So if I'm to understand, for purposes of your analysis, you could include samples from all over the United States and it wouldn't matter to your opinion, would it? 01:16PM

MS. COLLINS: Object to form.

A Well, it depends on the concentrations. I mean, it depends on how it would influence the population. This is, for the most part, an IRW population, but what you're pointing to is perhaps a dozen or so samples, and in the context of total of 317, it's just the pimple on the elephant's back. 01:17PM 01:17PM

So it doesn't influence the distribution of the population, no.

Q Tell the court why you would not use some reference or control site such as was sampled by the State of Oklahoma for your analysis to determine impact within the IRW. 01:18PM

MS. COLLINS: Object to form.

A Well, it is incorporated in the first analysis, the reference -- by reference. I mean, it's -- part of the problem is you don't know if the samples that were selected by CDM to represent their reference samples had the same type of impact within the IRW. So there's no way of knowing if it's apples and apples or apples and oranges. That's why I went to this distribution approach for the IRW samples. 01:18PM

Q But that's just a generalization when you would use a distribution approach, isn't it?

A No, because it captures all the impacts within the IRW. 01:19PM

Q But it generalizes them into what would you have described as a bimodal distribution; correct?

A Well, that's how the data falls out. It's not a question of generalizing. It's just a question of that is the dataset. 01:19PM

Q In Exhibit 14 the lake core sediments are included in that dataset; is that correct?

A That is correct.

Q Can you tell me why you would use the lake core sediments that date back as early as 1950s? 01:19PM

A Because of that juncture, I was using the entire dataset. In this revised presentation here you'll see I've excluded the lake core dataset.

Q Okay. Why did you include it in your report originally is my question? 01:20PM

A Because it was part of the sediment data in the sediment database that the State provided, and I decided over the weekend when I went back and looked at that, it would be a good idea to see what the impact of what those lake core sediments were on the 01:20PM population distribution, and as you can see, when I exclude them, the concentration changes a little bit and it goes up by 20 PPM.

Q What adjustment did you make for the lake core sediments for the water percentages in the sediment 01:20PM cores?

MS. COLLINS: Object to form.

A I don't understand the question.

Q Let me ask you this: Did you use wet weight samples for purposes of your analysis? 01:20PM

A I used the data that was provided as total phosphorus in the State database.
Q And do you know whether or not that's wet weight sampling or is that a dry weight?
A Normally it's dry weight, the way it should be reported across the board. They should have been -- they should have had uniform types of analysis for sediments. 01:21PM
Q And understanding that, did you in fact inspect the database to see whether or not wet and dry were both reported? 01:21PM
A Well, they may have both been reported, but I used the total as described by the State for total phosphorus.
Q And do you know whether or not that's based on a wet basis or a dry basis? 01:21PM
A I presume it's a dry basis, but I don't know. That's how a scientist would normally describe it.
Q As a dry basis?
A Yes. 01:21PM
Q But you don't know how it was described by the CDM for purposes of that database, do you?
A Well, not as I sit here without going back to the database, no.
Q Well, did you make that determination before 01:21PM

you used the numbers?

A No. I assumed they would use total phosphorus on a dry weight basis, which is what a reputable scientist would do if you are doing a database and you're comparing different sediment samples. 01:22PM

Q So based on that assumption, you assumed that the lake core sediments were also shown as dry weight basis?

A That's correct. In the grand scheme of things, it's irrelevant because when you remove the 01:22PM lake core sediments, as you can see, the population dynamics stayed virtually similar.

Q Well --

A The same.

Q -- Dr. Davis, that material is not in your 01:22PM report. It's not in your considered materials, and I don't consider it to be timely for purposes of your opinions in this case. So I'm not giving any weight to what you've done yesterday or this weekend. 01:22PM

So for purposes of this deposition, I'd like for you to continue to refer to that material that you've already applied -- I mean, provided to the State and that which you used to form the opinions that's in your written report. Is that acceptable 01:22PM

to you from now on?

MS. COLLINS: You're asking him what his opinions are and the bases for those opinions, and he's given you his understanding. Now, if you want to limit -- 01:23PM

MR. GARREN: No. He volunteered information that was not part of my questions when he said he's done some other analysis and brought that forward. I asked him what he did for purposes of this case and that's been the limit of my 01:23PM questions, and I'm not intending, nor am I waiving any rights because he's brought that into this deposition, that we are going to allow that testimony or that evidence to come into trial at this late stage when it's not part of his report 01:23PM that was due in January. That is my point.

Q So I don't want to confuse the Record, Dr. Davis, but what I'm just asking you to do is to refer to those materials that are in your January report or your errata and not anything else so that 01:23PM the Record is clear. Can you do that?

A Well, no. It's part of any analysis. So I mean, I'm going to refer to what I want to refer to, and then it's up to you to deal with the legal niceties of how you see fit. 01:24PM

Q I'm telling you right now that's not the way it's going to go because I'm telling you, my questions are deemed to be on your analysis as written in your report and provided to the State as it was required to do under the scheduling order, and for you to interject some new analysis now is unacceptable. I don't want the Record to be mistaken. I want it to be clear that what you're talking about in this report and your testimony is only about your report and not some subsequent analysis done after the fact. All right? 01:24PM 01:24PM

MS. COLLINS: If you would like to make a representation so that you're limiting your questions from here forward to a specific written report and you don't want to inquire into what his actual opinions are, then we can certainly go with that caveat going forward, but to admonish him for giving you responses that are beyond that because you haven't tailored your questions in that way is inappropriate. 01:24PM

MR. GARREN: Well, we can argue about whether my questions are tailored properly or not.

Q The point I'm trying to make is going forward, I want your analysis and your information and opinions that support your report or the errata that 01:25PM

you've provided to the State prior to this deposition, okay, and if I want anything different, I'll make it clear but going forward, that's my intent.

MS. COLLINS: Well, then you need to limit your questions. 01:25PM

MR. GARREN: You can argue about the form by making your objection then.

MS. COLLINS: Well, but, no. I'm going to direct him to give his best answers based on his knowledge and his expertise thus far and not carve out some piece of information that you say you don't want. So you can be -- you can tailor your questions and you can ask him what the basis is. 01:25PM

MR. GARREN: His opinions are only those that are expressed in the report. He is not entitled at this stage to change his opinion, give new data that is three or four months past the date that this information was due under the scheduling order, that you, the defendants, have made it quite clear that you want the plaintiff's experts to do their shot in time and be hand bound not to explore, not to review, not to do any additional analysis from that point forward. If that's what the defendants want, I would like for this deposition, 01:25PM 01:26PM

Dr. Davis to limit his opinions, his questions to the report and analysis that has been provided under the January letter and the errata given to us late yesterday afternoon. That's all I'm asking because we're not going to waive and allow other information to come in that the State hasn't had a chance to review. 01:26PM

MS. COLLINS: The objection is noted. The only reason this came out is because of the question you asked him. 01:27PM

Q Okay. Is it your opinion, sir, that the 1950s and '60s sediments you incorporated into the database were fair to use in establishing your screening tool in this case?

A Well, they can be, but that's why I did the subsequent analysis, to see what the impact of having them in the data would look like. 01:27PM

Q What did you do to confirm whether or not the lake sediments, water content was calculated and actually reduced to a dry weight equivalence? 01:27PM

MS. COLLINS: Object to form.

A I think I've answered that line of questioning. I didn't do anything specifically. I just assumed that from a professional basis, it would be on a dry weight comparison in the database. 01:28PM

Q Well, if both were reported, wouldn't it be professional on your part to have used the dry weight yourself?

MS. COLLINS: Object to form.

A That's my understanding of what we had. 01:28PM

Q Okay. You do understand that both were reported, do you not, in the dataset, wet and dry weight?

A I didn't go back and do an exhaustive examination of that, no. 01:28PM

Q I hand you what's Exhibit 15. It's the same dataset that's Exhibit 14 sorted in this case by results. With regard to lake sediment samples, do you, sir, know or have an opinion whether or not the sediments at the higher level, meaning closer to the 01:29PM top, would have different water concentrations than those at the lower level, that is, closer to the soil?

MS. COLLINS: Object to form.

A Well, this is all the data I have, so I just 01:29PM used this data. I don't know -- I'm assuming the moisture contents would have been standardized and there would be a dry weight basis.

Q You would agree that your original report and opinion is based upon a dataset that does include 01:30PM

duplicates, does it not?
A It did, and that's why I did that analysis, was to remove the duplicates in the database. I just used the State database, and I noticed this anomaly and that's why I did the reanalysis. 01:30PM
Q Why did it take you four months after your report to notice that anomaly when you had that data for months in advance of doing your report initially?
MS. COLLINS: Object to form, 01:30PM misrepresentation.
A Because I just happened to see it plotted out that particular way when I was reviewing my considered by data as well.
Q Did you look at the column descriptive 01:30PM headings in the State's database before you used the data that you did use?
MS. COLLINS: Object to form, asked and answered.
A Well, we downloaded the data from a website. 01:30PM So I didn't go back in and look at the specific data in the raw form, no.
Q So who -- so what website did you download it from?
A It was a website that Miss Collins offers, so 01:31PM

I'm not sure on the specifics of that.
Q Do you know whether or not you in fact got all of the State data from that website when you downloaded?
A Best of my knowledge, yes. 01:31PM
Q How do you know?
A Well, we went back and tried to pull all the information out that had to do with phosphorus in the Illinois River watershed.
Q And in doing that, did you notice the column 01:31PM headings, the descriptive column headings as to whether or not it was wet, dry or some other designation?
A Not at that particular point in time, no.
Q And when did you first notice that? 01:31PM
A Well, I haven't seen wet or dry. I'm telling you I think this is all dry base is my understanding.
Q All right. Would you agree with me that if it is a wet base that you use, that sediments 01:31PM throughout the watershed are going to have a large variability of percent water within the samples?
MS. COLLINS: Object to form.
A I think that's impossible to determine, but the bottom line is that we have a decent 01:32PM

distribution in terms of the different populations, and my sense is, based on the statistics, if you include lake sediments or don't include lake sediments, you'd have a pretty similar answer, but I'm assuming that the river sediments would have been treated in the same way based on my review of Dr. Olsen's standard operating procedures. 01:32PM

Q Are you telling me, sir, that if you have a column of wet samples listed in a database, that looking at a column of solids of those same samples, it would be impossible to determine if there's some variability in the moisture content within the samples? 01:32PM

MS. COLLINS: Object to form.

A Yeah. I don't know how you would do that without having a moisture content identified along with the sample. 01:32PM

Q Let me hand you what's been marked Exhibit 2.

A Are we done with these?

Q For now. Just lay them there in front of you. We may or may not get back to them. Do you recognize this document, sir? 01:33PM

A Yes.

Q Can you tell the court what it is?

A It's a description of total phosphorus. I 01:33PM

think it comes from Engel's report actually by source over time.

Q So you didn't prepare this yourself?

A Well, I did. I used the data or the figure from Mr. Engel. 01:34PM

Q Did you do anything to verify the accuracy of the data that you used?

A No.

Q Do you believe it to be accurate?

A I've seen some dissension about numbers of chickens, so I simply just made a record of data. I don't know if it's accurate or not. 01:34PM

Q Okay. Did you use or rely on this Exhibit 2 for purposes of forming any of your opinions?

A No. 01:34PM

Q Can you tell me what is the animal unit used for beef cattle and heifers calved in this particular set?

A No.

Q Okay. Can you tell me what it is for chickens or turkeys? 01:35PM

A I assume it's just the number. If you ask me the number of animals, I suppose it's true for all of them, times -- you have for multiply that by, I think, 2,000. So the top scale would then become 01:35PM

3.2 million.
Q Okay.
A I assume the same is true for all the rest of the organisms.
Q Would you agree, though, that what this depicts is that these animal categories are listed on an equivalent animal unit basis? 01:35PM
A I think that was the case or the objective, yes.
Q Okay, and based upon looking at this, would you agree with me that chickens are by far the largest phosphorus contributor based on animal units? 01:35PM
MS. COLLINS: Object to form.
A Based on this depiction but, again, I can't speak to its accuracy. I didn't go back and check it. 01:36PM
Q Do you agree that in looking at this Exhibit 2 from the data that is presented, there is a clear acceleration of phosphorus contribution from chickens from about 1955 to the end of the line shown for chickens? 01:36PM
MR. BURNS: Object to form.
A Based on this interpretation, it looks like a linear increase if this data is correct. 01:36PM

Q You have no information or data to suggest that it's not correct, do you?
A Well --
MS. COLLINS: Object to form.
A -- I've got no information to know if it's correct or incorrect. 01:37PM
Q Does it appear to you that since about 1985 on this chart turkeys have contributed a greater number of phosphorus by animal units than either category of cattle? 01:37PM
A Well, if this is correct, certainly on an individual basis, if you combine the cattle and the beef cows, then there would be less if these numbers are correct.
Q When you prepared your report and you identified your screening tool, did you round it up for purposes of your screening tool? 01:37PM
MS. COLLINS: Object to form.
A Not that I recall. I think -- you say the 460, is that what you mean, that number? 01:38PM
Q Yes. Isn't that what you referred to as your screening tool?
A Yeah. That was the intersection between the lines.
Q For purposes of your report and analysis and 01:38PM

the rest of your report, did you round it or did you continue to use it at 460?

MS. COLLINS: Object to form.

A I don't understand the question.

Q Okay. We'll come back to it when we hit it. 01:38PM

You indicated that you always use average when there were multiple samples. Did you round the numbers from the State's data samples?

MS. COLLINS: Object to form.

A Are you talking about surface waters? 01:39PM

Q I'm talking about anything, sediments or waters. Did you round numbers off for purposes of your report?

A Oh, oh, oh. I understand what you're saying now. Yes. So if it was three figures, I rounded it 01:39PM to two significant figures, for example.

Q And did you round up or down when you rounded?

A I think it depends on the number. I tried to follow protocols. I may have missed one or two, but there isn't a significant change in the description 01:39PM of concentrations.

Q Did you use the USGS sampling data that was contained in the State's sampling results?

A I used whatever was in the State database.

Q My question is, do you know whether or not 01:40PM

USGS data was in the State's database that you also used?

A No, I don't.

Q Did you include spring sampling data in your work? 01:40PM

A I would have included I believe anything that was adjacent to the Cargill facilities. Now, spring data, there may have been one location where there was spring data, I didn't include it, but I included everything else. 01:40PM

Q Did you include groundwater sampling data in your work?

A Yes.

Q Let's look again at your report at Site OK-1. You've now corrected that site, have you not, to name a different owner? You had P. Fisher on there originally. 01:40PM

A Yes, that's correct.

Q Do you know where you got the name P. Fisher?

A No. 01:41PM

Q Were you responsible in identifying the names of these sites or was someone else for you doing that?

A No. I got that from counsel.

Q The site that you show as OK-01, is that site 01:41PM

within the boundaries of the Illinois River watershed?

A Yes.

Q On your aerial, what is the -- I'm going to point to it. What is the yellowish line running through your aerial on that Page 8 of your report? 01:41PM

A Actually I think that could be the edge of the IRW because I recall that OK-01 has got some houses outside the boundary and one inside the watershed.

Q So what site were you relying on for purposes of your analysis; is it the OK-1, which is outside the IRW? 01:42PM

A No, because it's on the ridge line, and OK-01 has five houses or so to the northwest and one house that's pretty much on the ridge line, which would drain potentially into the Illinois River. That's why I looked at that site. 01:43PM

Q And how do you say potentially it will drain into the Illinois River?

A Well, because it's upgradient of the Illinois River, so it's higher than the Illinois River, and so that's why you have to go look at the location and understand if there's the potential for the source receptor pathway to be complete. 01:43PM

Q Okay, and did you do that? 01:43PM

A Yes.
Q And did you determine whether it had the potential of flow to the Illinois River, that is, OK-01 or did it actually flow to another drainage area, not the Illinois River basin? 01:43PM
A Well, as I said, part -- part of the property and part of the houses are in the other watershed boundary, and then one of them is in the potential catchment area for the IRW.
Q The way I understand your report, what you have cited as OK-1 by lat-long is in fact a point outside the Illinois River watershed. Did you do your analysis for the four houses outside the watershed or for the single house inside the watershed? 01:44PM
A For the house inside the watershed, and perhaps I could clarify this. Do you have those photographs by any chance, the hard copy?
MS. COLLINS: These are the Bates numbered photographs. I've had them printed. Do you want a set? 01:44PM
MR. GARREN: That would be fine if he's going to refer to them.
A There's two pictures, 798 and 799, and so what I did was to walk over to this house, houses, house, 01:47PM

sorry, and I located some damp spots, which were where the green grass is shown in 798, and there's no evidence of runoff. In fact, there appeared to be almost a basin in that area. So I determined the chances of any runoff from litter that had been applied in this field would not occur. 01:47PM

Q That isn't my question. My question was, is OK-1 a site within the IRW or outside the IRW in your opinion?

A In my opinion that one house has the potential to drain into the IRW, and that's why we list it. 01:47PM

Q Okay, and so the pictures 798 and 799 that you've alluded to is a picture of the single house that you say is in the watershed; correct?

A Or could be, yes. 01:48PM

Q Or could be, okay. Did you use the groundwater from wells' data in the CDM database?

MS. COLLINS: Object to form.

A Yes, where I had groundwater data included as not OK-01. 01:48PM

Q In your report generally do you use the groundwater samples from wells?

A Yes, if they're adjacent to sites.

MS. COLLINS: Are you talking about water wells? 01:48PM

MR. GARREN: Pardon me?
MS. COLLINS: Well, water wells?
MR. GARREN: Yeah.
Q We talked about springs. We talked about --
MS. COLLINS: As opposed to the person Wells, Dr. Wells. 01:48PM
A I used the groundwater data that was provided.
Q Okay. Did you use any soil data in the CDM database for purposes of your analysis?
A Yes. I've shown the soil data where it's in the shot here. 01:49PM
Q Are you saying soil samples or are you referring only to sediments?
A No. I consider soils to be dry land samples, and sediment to be in water samples, so I used both. 01:49PM
Q Okay. What did you do to determine if there were any best management practices in place at any of the Cargill sites?
MS. COLLINS: Object to form.
A I didn't assess that. 01:49PM
Q Did you assess whether or not there are any BMPs business -- or best management practice in place at any of the land application sites for poultry waste?
MS. COLLINS: Object to form. 01:50PM

A No. I restricted my analysis to the 34 Cargill houses.

Q Would you agree with me that in identifying environmental sources of contamination, it is uncommon to have information concerning all sources? 01:50PM

MS. COLLINS: Object to the form.

A Depends on the investigation, depends on the objectives of the investigation.

Q But isn't it uncommon generally to have all sources of information in an environmental 01:50PM examination for contamination?

MS. COLLINS: Object to form.

A No.

Q Okay.

A Could you ask that question again? I may not 01:51PM have understood it correctly.

Q Would you agree that in identifying environmental sources of contamination, it is uncommon to have information concerning all sources?

MS. COLLINS: Same objection. 01:51PM

A No. I think that oftentimes all sources are understood.

Q Okay. Do you agree that in environmental forensics investigations you really have a priority knowledge of all sources? 01:51PM

MS. COLLINS: Object to form.
A Depends on the investigation I suppose.
Q Would you agree that it's typically -- what is typically done is to collect a lot of samples and not necessarily have one from all sources in an environmental contamination case? 01:52PM
MS. COLLINS: Object to form.
A Absolutely not. I mean, that's one of the key goals is to understand the relationship between the potential sources and the receptor. That's why people go to great lengths to identify what those pathways look like and to compare source receptor relationships. 01:52PM
Q Okay. Do you agree that if samples show contamination sufficient to impact the waters or have detectable concentrations, the pattern of those sources will be identified? 01:52PM
MS. COLLINS: Object to form.
A I'm not sure exactly what you're talking about, but I think no is the answer. 01:52PM
Q Are you familiar with a book entitled Introduction to Environmental Forensics, Second Edition, edited by Brian Murphy and Robert Morrison?
A I've heard of it but I'm not familiar with it.
Q Have you read it? 01:53PM

A No.
Q Do you know whether or not it's an authority and scientifically accepted as authority in the field of forensic environmental investigation?
A No. 01:53PM
Q You don't believe it is?
A I don't know.
Q You don't know, okay. Do you know how many samples were collected by the State in this case?
A Of what? 01:53PM
Q Samples, water, soil, sediment. How many samples were collected in the water to determine those pathways to those receptors that you talked about was necessary or needed?
A Well, I'd say probably about 200 soil samples 01:53PM and 300 sediments and perhaps -- and I'm sort of being generic here just based on number of analytes and number of records for different constituents -- perhaps a couple hundred groundwater samples. It's a bit of a spotty dataset for the area really. 01:54PM
Q Did you do any dye flow sampling tests at any location?
MS. COLLINS: Object to form.
A No.
Q I do not see in your report, and tell me if 01:55PM

I'm wrong, that you have not identified any specific anthropogenic sources peculiar to any particular site; am I wrong on that?

MS. COLLINS: Object to form.

Q You seem to reference your Appendix B for that, and I'm trying to find out what specific anthropogenic sources you might have identified for any of the site locations. 01:55PM

A I think there was one site where I noted that it was adjacent to a village of some sort, so it could have been -- 01:55PM

Q What used to be Springdale but what you changed to Springtown; is that the one you're talking about?

A Correct, yes. 01:56PM

Q Do you know what the population of Springtown is?

A I was looking at the number of houses. Probably about perhaps 50 to a hundred.

Q Were you the one to put the name Springdale on there or was it someone else? 01:56PM

A It was me. I got confused.

Q How did you come to realize that it was wrong?

A I was told it was wrong.

Q Who told you? 01:56PM

A I forget. It was either Ken or Melissa or somebody.
Q Did you at any time quantify the volume of input at any of the anthropogenic sources that you reference? 01:56PM
MS. COLLINS: Object to form.
A No.
Q Let's look at Site OK-3. There is a sample in there in the middle of the page that says 334.53; do you see that? 01:57PM
A Yes.
Q Okay. Can you tell whether that number was taken exactly from the CDM data?
A It's probably an average of two samples.
Q Let me hand you what's been marked as Exhibit 3. This is from your dataset. You manipulated the State's dataset into another dataset you worked with; is that correct? 01:58PM
MS. COLLINS: Object to form.
A We didn't manipulate it. 01:58PM
Q Well, you adjusted it, you cut and pasted it, that sort of thing?
A We extracted information the way it was. We didn't change anything.
Q I'm not suggesting you changed it. I'm just 01:59PM

saying you manipulated it in a way that you would use it differently than what it was depicted in the State's database?

MS. COLLINS: Object to form.

A We extracted the pieces we needed to do the analysis. 01:59PM

Q Okay. On this Exhibit 3, can you tell me where that 345 number comes from that's shown on your aerial?

A The 334.53? 01:59PM

Q Yes, sir. The 334.53, can you tell me where it's located?

A Yes. It looks like it would be averaged between the 208.45 and the 460.61.

Q Okay, and those samples were taken, one in October of '05 and another was April of '05; correct? 01:59PM

A That's correct.

Q Why would you not use just simply one of those samples or show them both there? 01:59PM

A Because if I used 208, you'd probably accuse me of using the low number, and I felt using the 460 was inappropriate given the fact that we have the 208. So it seems reasonable to average the two.

Q And you could have used the 460 number, 02:00PM

couldn't you?
A I could have used the 208 number.
Q You've already said that, but you could have used the 460 number, couldn't you?
A I could have, and I could have used the 208. I elected to use the average. 02:00PM
Q Do you think that's scientifically accurate and correct to average two samples for comparison purposes that are six months apart?
A Yes. 02:00PM
Q And how is that accurate with regard to a sample upstream that may have been taken at or about April of 2005; wouldn't you want to compare the two?
MS. COLLINS: Object to form.
A Well, first of all, there's no reason to choose one over the other. Secondly, in the grand scheme of things, that sample is upstream from OK-03, and so it's irrelevant to OK-03 and, thirdly, the concentrations, the average concentrations and even the individual concentrations are below what I would consider to be impacted. 02:00PM 02:01PM
Q What if you had a sampling event in between April of '05 and October of '05 at a Cargill location; would that not have some impact on whether or not you should use one or the other sample? 02:01PM

MS. COLLINS: Object to form.
A Well, hypothetically if there's a third sample in between these two; is that what you're saying?
Q No, sir. I'm talking about in time. If a land application occurred between April of '05 and October of '05, would the April of '05 sample be of little or no consequences to determine whether that land application impacted subsequent to its application? 02:01PM
MS. COLLINS: Object to form. Are you making a representation that that happened or are you asking him if -- 02:01PM
MR. GARREN: No. I'm asking a hypothetical.
A Well, it wouldn't make an impact because my assumption was that the litter would be spread adjacent to the house. OK-03 is downstream of that 334, and so it would be completely transparent to any 0K-03 impacts. 02:02PM
Q Would it make a difference if that site was upstream from the sample location that we just talked about in your opinion? 02:02PM
MS. COLLINS: Object to form.
A It's not, so I can't answer the question. It's a complete hypothetical. I mean, I used the data so, you know, I don't know is the answer. 02:02PM

Q Okay. Your goal was to identify site-specific Cargill locations and whether or not the activity on that location caused any impact to the Illinois River watershed; correct?

A That I could discern using the data from the State, yes, yes. 02:03PM

Q Okay, and would you agree with me that you have ignored the possibility of when land application did occur from each of those sites?

MS. COLLINS: Object to form. 02:03PM

A No, because I'm looking at the data the State pulled together, and in theory, if there was land application, there should be some sort of response at some point in time following whatever release you're hypothesizing might have occurred. 02:03PM

Q And do you know what that normally would be; did you study what kind of a release -- what kind of response time would occur after release; do you know what that is?

MS. COLLINS: Object to form. 02:03PM

A Generally, yes.

Q And what would you expect it to be in the Illinois River watershed?

A Well, I would suspect -- again, it depends on the location of the manure and the conditions 02:03PM

surrounding the potential release and the types of topography that we're examining, and, I mean, you could have hypothetically all sort of variants around that theme, but what I'm pointing out to you is OK-03 does not appear in my opinion to be the progenitor of this average 334 because that point it's upstream, and that is not the way I assumed my study to be set up. 02:04PM

Also, just one other issue that falls out of this OK-03, I notice on this exhibit that you've got surface water concentrations, and it just jogs my memory, that what we did was to look at total phosphorus. We talked about this morning, and also I said this morning that I felt that averaging these concentrations was reasonable for multiple sampling events. As you can see, I think that these -- this dataset bears out that representation because the concentrations were all very similar. 02:05PM

Q Ask the answer be stricken. It was not responsive to any question pending before the witness. 02:05PM

MS. COLLINS: He was clarifying an earlier answer. Are you saying that's impermissible?

Q Do you know when most poultry waste applications occur in the Illinois River watershed? 02:05PM

MR. BURNS: Object to form.

MS. COLLINS: Object to form.

A I believe it's in the spring or early summer.

Q In their text on this Page 10 you refer to a surface water sample of .035 milligrams per liter. 02:06PM

Can you tell me where that is shown on your aerial on Page 10?

A Oh. I believe this is one of the errata points. I think that's when we thought that the drainage was over to the east. Yeah. I corrected 02:06PM it in the errata.

Q And so you're referring now to the .3933 location; is that correct?

A Yes, and actually the .035 was a groundwater sample come to think of it. It was further down the 02:07PM drainage. I think that is in, yeah, Appendix B. There's the .035, and I realized that was a groundwater sample or what's been defined as a groundwater sample in the database. So that's what led to that correction in the errata. 02:08PM

Q Why don't we go ahead and change the tape and I'll get the next exhibit out.

VIDEOGRAPHER: We are now off the Record. The time is 2:08 p.m.

(Following a short recess at 2:08 p.m., 02:08PM

proceedings continued on the Record at 2:16 p.m.)

VIDEOGRAPHER: We are now back on the record. The time is 2:16 p.m.

Q Dr. Davis, talking about surface water, in Page 5 of your report you point out that you use a rounded up number as .04 as a screening level. Do you remember that in your report? 02:16PM

A Yes.

Q All right, and looking at Exhibit 5 that I just gave to you, that is your dataset, and attached to it is the CDM dataset for that location OK-05. I'd ask you to look at the aerial in OK-05 to begin with and tell me where in the dataset the .1093 sample is shown in either your dataset or CDM's dataset. 02:16PM

A Well, this is an average. I assume if that's the RS-000667 data point; is that what you are referring to?

Q Yes, sir.

A And so that number is the average of these data points. Is that what you -- 02:17PM

Q I'm asking you to tell me how you got it because I don't believe that to be the case, and I think it's an error on your part, and I'm trying to confirm that it is. 02:17PM

MS. COLLINS: Object to form.

A Well, I don't know if that's -- I don't know if that's that sample or if it's the .03 sample or what.

Q Well, let's look at your dataset on Exhibit 5. Fifth one down, do you see the number 1.090? 02:17PM

A Yes.

Q Okay, and do you see that number is also rounded by you?

MS. COLLINS: Object to form. 02:18PM

A Rounded where?

Q Well, every number on your dataset is rounded to zero and the third digit, is it not, looking at Exhibit 5, your dataset?

A Well, there's a .03 there. 02:18PM

Q Let's just concentrate on one thing at a time and we'll get where we need to be. Looking at your Exhibit 5, the dataset that you have used, it's all -- all those numbers in the surface water RS-0667 have been rounded to two digits; correct? 02:18PM

MS. COLLINS: Object to form.

Q In this column here, sir.

A Oh, oh, I'm sorry. Oh, I see. So we have the .03, which would be I assume the average of the base of the list of data points here. 02:19PM

Q Look at the next page of Exhibit 5 and you'll see the CDM data from which you rounded from. Do you see the fifth number down that's 1.093 milligrams per liter in the result column?

A Yes. 02:19PM

Q And do you see where you've rounded that to 1.090?

A Right.

Q All right, and if you look at your aerial on Site OK-5, you see a 0.1093. Is that an inadvertent 02:19PM -- is that an error as a result of a placement of a decimal point?

A No. What this sample is I believe is the average that's .03 -- well, that's the 290.1, the sediment, because the way I think that's correct is 02:19PM if you look at the same sediment sample here on the first page, you can see the 290.1, which is on the same page here as is .03. The .03 I think is the result of the average of all of those data above that .03, which is in this second box down. It has 02:20PM nothing to do with the .1093.

Q I didn't follow you. Where are you saying the data point is for the 0.1093 in the data on Exhibit 5?

MS. COLLINS: Object to form. 02:20PM

A Okay. There's a .1093 concentration at the bottom of this depiction.
Q Correct, and is that a surface water?
A That is a surface water sample.
Q All right. 02:20PM
A There's also a 0.03, okay, which is next to the 290.1, which is sediment.
Q Correct.
A The accumulated average of the data you provided to me appears to be 0.03 I think. I'm not 02:20PM understanding something here for sure. I don't know where this RS-000667 is, and I don't know how -- whether or not this data point even relates to which of these data points on this plot.
Q Well, it's your aerial and you created it, and 02:21PM I'm trying to figure out where you got the plots on your aerial from the database that you said you used to get it there.
A Right. I'd have to go back to the database and then cross -- 02:21PM
Q Isn't this database in Exhibit 5; isn't this the database that you would have used for that site?
MS. COLLINS: Object to form. There's no correlation.
A I don't know is the answer as I sit here right 02:21PM

now.

Q Looking at Exhibit 5, do you see where it says location RS-0661?

A Yes.

Q And do you see that that is .030? 02:21PM

A Correct.

Q And do you think that is not in fact the .030 that's listed in the aerial you just now talked about?

A The .03, okay, it could be, yes. 02:21PM

Q Now, if you look at the one above it, we have a different point at RS-667, and that has no average listed in your tally there of the data. I'm trying to inquire as to whether or not the 0.1093, which I believe to be that site, is a misstatement on your 02:22PM part as to what the numbers should be or if it's in fact an average. Can you tell me?

MS. COLLINS: Are you representing that you know or have information that connects RS-000667 sample location with what is depicted on here as 02:22PM .1093 in terms of location, something that keys those two together so we know we're talking about the same thing?

MR. GARREN: Dr. Davis has that in the CDM database with everything identified as the lat-long. 02:22PM

He put these points on his aerial. I would assume he, too, would know that.

MS. COLLINS: Yeah. Well, and he just told you he would have to go look at the database to be able to answer your question. 02:22PM

A I can't know without going back to the database and making that inquiry. There's no way to know.

Q Who checked your numbers when you created these aerials against the database besides Dr. Kolm? 02:23PM

A I asked him to do that, and occasionally I went back and also asked Jessie Sheffield, who is on my staff, to do that.

Q All right. Let's look at Exhibit 5 alone, and the two pages, do you see the CDM database where it references the results and you see the database that you used to the rounded numbers? Can you show me at any place on those -- on your database where you rounded up as opposed to down? 02:23PM

A So you want me to compare these two; right? So compare -- 02:23PM

Q The result columns.

A -- the result columns here with the result column here.

Q Can you tell where you rounded up as opposed 02:24PM

to rounded down on any number shown on this document?

MS. COLLINS: Object to form.

A Well, these -- I don't know if these are different numbers or what but, for example, the first number says .051 on this page and here it says 0.03. Next one is .045 and it says .17 over here. You have a .029 and .04. I don't see the correlation to be honest here. So I can't answer the question. 02:24PM

Q I'll represent to you that the CDM database is pulled in the way that it was kept. I'm just as confused as you, and that's why I'm inquiring how it is that you caused these numbers not to be in the same order that they were previously. Do you know how that occurred? 02:24PM

A I don't have the first idea.

Q Okay.

A What I do see in the CDM database here is a non-filtered sample, for example. So we would have pulled out whatever is called total phosphorus from the database, and it could well be those different flavors of phosphorus in this particular CDM database, and that might explain where we see a smaller number and, I guess a smaller number would 02:25PM

make the most obvious sense.
Q Are you looking at Exhibit 5 in the CDM database?
A I'm just comparing, contrasting the two databases because the CDM database has two, four, six, eight, ten, sixteen, eighteen, twenty records and ours has two, four, six, eight, ten, twelve, sixteen, eighteen -- well, ours has 20 as well. I'd have to go back and look at the database and see -- 02:25PM
Q It would appear --
A -- what the explanation was.
Q It would appear that based on the numbers you've just added that the non-filtered entry is included, doesn't it?
MS. COLLINS: Object to form. 02:26PM
A Well, I don't see it because all of ours have phosphorus total, and there's a non-filtered here. So I don't know how this CDM database is pulled out, first of all. So without going back and looking at the CDM database that's been excised here and see if it's truly representative of what we've got, I couldn't tell you. 02:26PM
Q Why did you remove the dates from your samples in Exhibit 5; I mean, why did you remove that where it's difficult to tell what sample you're talking 02:26PM

about?

MS. COLLINS: Object to form.

A Well, I didn't remove them per se. This is just what we produced. There was no attempt to remove dates. 02:27PM

Q Well, you did remove them because this is what you relied on because you produced it in your considered material. Why would you take the dates out when you are trying to do your work on this dataset? 02:27PM

A Because we're looking on a site-specific basis for total phosphorus is why, so the dates were really transparent material to us. Actually, as I come to look at it now, I can sort of see some correlations just being sourced in a different way, 02:27PM and that's why they don't tally up next to each other seems to me.

Q Let me hand you what's marked as Exhibit 6. This has the OK-05 site located on it in the lower right-hand corner. Do you see that? 02:29PM

A Yes.

Q Do you see where the Sediment 025 location is on this upper right-hand portion of this?

A Yes.

Q Is that a sample that you relied on in 02:29PM

estimating or analyzing this Site 05 --

MS. COLLINS: Object to form.

Q -- OK-05?

A Yes.

Q Tell me why you would rely on that particular sediment sample which is not even part of the stream flow from OK-05. 02:29PM

A Why do you say it's not part of the stream flow?

Q Well, I see that there's a confluence of where the stream that goes past OK-5 to the north then has a new stream entering above as part of the site location SD-025. Do you not see that? 02:30PM

A Well, you're referring to the blue line; right? 02:30PM

Q Yes, sir.

A Well, you can see here where the blue line is completely inaccurate as to where the stream is going. So the blue line is not the be-all end-all of where the confluence is going. Looks to me like it's going just to that red dot there. 02:30PM

Q Okay, and so would you agree with me that this has a better resolution than Google Earth relied on by you at this site?

MS. COLLINS: Object to form, and as to 02:30PM

Exhibit 6, I object to the use of this exhibit to the extent that the lat-long is not represented on here, nor the person who generated it; therefore, there's no way for us to confirm this is accurate, but if you want to question him on it, go ahead. 02:31PM

Q Can you tell, sir, from your report and the aerial of Site 05 that that sediment sample is in fact part of the same stream flowing to the north from OK-05 site?

MS. COLLINS: Object to form. 02:31PM

A Well, it's hard to tell.

Q I'm asking you on your aerial.

A On my aerial?

Q Yeah. On the aerial you looked at, can you tell from it? 02:31PM

A Well, I saw where it had been placed in lat-long, and it appeared to be at the confluence so -- and why they put this, I think the location of surface water samples certainly seems to be on that same drainage. 02:31PM

Q Would you agree with me that it's not certain?

MS. COLLINS: Object to form.

A Well, I think I can see a drainage pattern here but, you know, obviously it would be helpful to be out at the site. 02:32PM

Q And is it your opinion --
A Let me finish. And whoever collected the sample, have them point out where the sample was collected, but the best of my knowledge right now, it appears to be downstream from the drainage. If it's not, then the situation becomes even more dire because there is no data point for miles anywhere near this particular facility. 02:32PM
Q Based on your testimony, you've not done anything to determine whether or not the poultry waste from OK-05 was land applied anywhere along the fields, along that blue line in Exhibit No. 6, did you? 02:32PM
MS. COLLINS: Object to form.
A Well, I assumed it was adjacent to the turkey house. 02:33PM
Q And how close to the turkey house did you assume it would be?
A Just in the next field over.
Q I'm going to give you a red pen and if you'd mark on Exhibit 6 where you believe and assumed the land application would have occurred for OK-05. 02:33PM
A Okay. I'm just going to assume this; right? What I'm assuming is not --
Q Okay, but put that in a solid line so we can 02:33PM

see it.
A Well, I would put a dash line because that's my assumption. I'll make sure the dashes stand out.
Q Okay. Let me look and see where you drew your line. Let's look at your report at Site OK-6, which is on Page 13 of your report. I don't see where your errata made any adjustments for this particular site. So let me ask you, sir, in the aerial right next to the OK-06 site, there's a Sample 0.1531. Do you see that? 02:34PM 02:35PM
A Yes.
Q Is that sample downgradient from OK-06?
A No.
Q In your text you talk about groundwater and surface water, and then you cite .04 as a sample collected adjacent to OK-06. Does it appear to you that the sample .1531 is at or near the same location of .04? 02:35PM
A Yes.
Q Why did you not reference it in your text? 02:35PM
A Because the flow is out to the east and then down that drainage and then off into the as I recall -- hang on a second. Let's go back to the other views. Yeah. The flows are off to the east on this site and then down -- the potential flow 02:37PM

anyway down towards this point on the southeast and wraps around, passes 215 PPM sediment and then goes on down to the 0.03.

Q Say that one more time, if you would, for the Record so I follow you. You're starting at the OK-06 site? 02:37PM

A Right.

Q And it flows which direction?

A Flows to the east there, down the gradient. At least that's where it would flow. This area is quite flat actually. 02:38PM

Q Well, you reference .04. How is it you can reference it and not .1531?

MS. COLLINS: Object to form.

A Well, I reference it -- I show it in the figure there. I have to go back and see what the relative spatial relationship is in some level of detail on those two particular samples. It could be they were .153 as a subdrainage coming in from somewhere else. I can't tell from the scale and resolution. 02:38PM

Q Okay. Let me hand you Exhibit 7 and see if the resolution on that exhibit is helpful.

MS. COLLINS: I object to any questions on Exhibit 7 as something that's never been produced 02:39PM

before in this case and is not giving any information to gauge the accuracy of the representation of the sample points and stream points.

Q I'll represent to you, Dr. Davis, that the lat-longs that are in the CDM database are depicted in accordance to the sample designations on the aerial of this Exhibit 7. Do you have an opinion, sir, looking at this Exhibit 7, whether or not the surface water and river stations RS-9002 and RS-786 or HFS-08 would be at a location that might have any impact from OK-06? 02:39PM 02:40PM

A Well, based on this particular depiction and, again, I don't know how accurate it is, RS-9002 would apparently be upstream of the confluence the way it's depicted here from the two creeks. RS-9002, I don't see any -- I must say I'm a bit confused because the sample labeled HFS-08 has got a matrix description as surface water, and yet it's blue as far as I can tell, but I'm seeing this for the first time. It appears to me that sediment sample, if that's HFS-08, is 171, which wouldn't appear to me to reference any impacts. 02:40PM 02:41PM

Q We're kind of wandering here. Let me ask this: Did you consider Groundwater 25 and 02:42PM

Groundwater 26 in your analysis on Site OK-06?

A I believe what -- one of those would be the .025 that's depicted here.

Q Okay.

A I'd like to know what the basis for this drainage map is here. I don't see an obvious drainage pathway. 02:43PM

Q Is it your opinion then from the Google Earth information that you relied on, it would be better than the aerial that we're seeing here for drainage pathway? 02:43PM

MS. COLLINS: Object to form.

A Well, I don't think you can tell from this particular screenshot to be honest.

Q And what would Google Earth tell you with regard to this general site location that you don't see here? 02:43PM

A Well, it shows me the three-dimensional orientation. What I think you can see in the figures -- in the appendix, the slope here appears towards the north, northeast, so -- 02:44PM

Q Which image are you looking at in your appendix; the lower image?

A The lower image, yeah.

Q And you believe that the slope and looking at 02:44PM

that is to the north, northeast?

A That's the way it looks. If you look at the drainage patterns here, you can clearly see the drainage patterns go in the opposite direction than the way it is depicted here. 02:45PM

Q On your exhibit in your report that's in front of you there, do you have the -- draw the direction of drainage pattern that you see on the three-dimensional with this blue pen. Maybe we ought to use the red ink so we can see it. Draw me 02:45PM the drainage pattern that you're identifying on that particular image -- I'm sorry. Draw it on yours, then I'll -- well, draw it on both. Show me the drainage pattern direction that you're observing.

A It seems to me more in this general direction. 02:45PM

Q Okay, and then do it again on the lower image on yours.

A (Witness complied).

Q And you describe that as north, northeast?

A I'm sorry. This is southeast. 02:46PM

Q Thank you. That's why I was confused. That's why I had you draw it.

A I'm confused because of the orientation of these things.

Q Well, they are all facing north to the top, 02:46PM

are they not?

A Not all of them, no. Some of them we rotate to give you a better understanding of the topography.

Q Looking back now at Exhibit 7 -- well, I'm sorry. I misspoke. The dataset that goes with OK-6, so if you'll look at datasets. Can you tell from this dataset what, if any, numbers you rounded up as opposed to down when you took them from CDM's database and moved them to yours? 02:46PM 02:47PM

MS. COLLINS: Object to form.

Q Do these even correlate that you can see?

MS. COLLINS: Asked and answered.

A Let me look. Would you mind if I mark on the exhibit? 02:47PM

Q No, sir.

A Looks like, best as I can tell after a cursory examination, four would be defined as they were in the CDM database. Two were rounded down because they were reported as .031 and .022, and I can't see the .037 analogously here. Also I'll note that there appears to be more surface water data points available in the database here that have phosphorus total surface water designation than have been reported in the CDM database. So, again, without 02:48PM 02:49PM

going back and do doing a detailed analysis, I don't exactly know why there's a difference.

Q Did you include the RS sampling stations with HFS station as your total surface water?

A No. 02:49PM

Q All right. Did you do anything on the OK-6 site -- I'm not sure -- No. 8 there in front of you I believe. Did you make any determination of subsurface flows on Site OK-6?

MS. COLLINS: Object to form. 02:49PM

A What -- did I put in monitoring wells and look at the gradient?

Q Yes. Did you do anything to determine what would be the direction of subsurface flow from Site OK-6? 02:50PM

A No. I don't believe anybody has done that, and I didn't either.

Q Did you do anything to ascertain the fault or fractures located at or near the OK-6 site?

A Well, there's no exposures. It's pastureland. 02:50PM There's no way to know. Neither the State did I don't think either.

Q Look at your errata. Did you change your statement of drainage patterns on Site Arkansas 12 and 13? 02:51PM

A I can't tell.
Q It appears that you've added another point, sampling data point of 0.235 milligrams. Am I reading that correct from the two?
A That's correct because it was hidden in the picture, so I wanted to make sure that that data was clear. 02:52PM
Q And can you locate on your -- is it located in your appendix, the other point?
A Let's look. 02:52PM
Q Yeah, I believe it is.
A Yes.
Q Do you know whether or not that is a separate sample at the same location or are these again not shown accurately to be in a different location? 02:53PM
A That would be the same sample -- sorry, would be a different sample at the same location.
Q Okay. So you've listed two samples from the same location?
A Correct. 02:53PM
Q As opposed to averaging them?
A That's correct, yes.
Q All right. Did you determine if there were any cattle allowed access to Site Arkansas 12 and 13 in your analysis? 02:54PM

MS. COLLINS: Object to form.

A I don't know if cattle have access or not.

Q Okay.

A I don't recall.

Q Did you make any determination of the Cargill -- any of the Cargill sites where cattle had access to those properties? 02:54PM

MS. COLLINS: Object to form.

A I do remember seeing some cattle at some location. 02:54PM

Q Do you know that they were at the location which would have been considered to you the area where land-applied poultry waste would have occurred in your assumption?

MS. COLLINS: Object to form. 02:54PM

A Well, that would be internally inconsistent since the idea is to promote grass growth, so having cattle there would not be inconsistent with that hypothesis.

Q But I'm asking your observation, sir, and that is, where you saw the cattle, were they in a location that was consistent with the assumption that you made as to where land application should have occurred on that site? 02:54PM

A For many of the sites that I recall that I did 02:55PM

see cattle, it was adjacent to the houses. So, yes.
Q Bear with me. I'm trying to make a comparison from your errata as I'm looking at my outline here. Based upon your corrections to your errata, you now know where Springdale and Springtown are located, do you not? 02:56PM
A Yes.
Q Springdale is a larger population towards the north and east?
A Correct. 02:57PM
Q All right. Do you know how many flocks go through a turkey house on an average year?
MS. COLLINS: Object to form.
A I suppose it depends on the breeder, but I suppose -- 02:58PM
Q I said an average.
A On average? I can't tell because it depends what the breeder is doing. I just know it takes about 20 weeks for maturation. So obviously some houses do different things with different flocks, so I can't tell you. 02:58PM
Q Let's look at Exhibit 10. I believe the first couple pages are excised from your data and the last pages excised from the CDM data. Based on your previous testimony, it's correct, is it not, that 03:00PM

you would have averaged for your data point on the site as HFS-02 surface water; is that correct?

MS. COLLINS: Object to form.

A Where is HFS-02?

Q You don't know by looking at this which one it should be? 03:00PM

A No, I haven't the faintest idea.

Q Do you know which one is RS-160?

A No.

Q Do you know what any of the sites actually are? 03:00PM

A No. My memory isn't, while brilliant, not quite that.

Q Okay, but consistent with your testimony, you would have averaged, would you have not? 03:00PM

MS. COLLINS: Object to form.

A Well, yeah, we would have averaged the total P, but we would have sorted it on total, and here, for example --

Q Looking at the CDM database page, which items on HFS-02 would have been included in your dataset in order to arrive at the average for whatever the point is on your aerial; can you tell me by looking at the dataset? 03:01PM

MS. COLLINS: Object to form. 03:01PM

Q Might be I can ask it easier this way, Dr. Davis. If you're looking solely at HFS-02, can you tell me, sir, in your analysis what of those points would you have taken in order to create an average; would you have used them all or some of them? 03:02PM

A I would have used the total, however the total is specified in the database. So we have a total P. I would have assume that we'd have used all the total P data since we've got a phosphorus total, not an analyte list. 03:02PM

Q Do you see the total P and the number behind it, that there's a parameter discussed there; do you know whether or not the total P was determined by different analytical testing?

MS. COLLINS: Object to form. 03:03PM

A It would look like it since there's different methods, which I recognize at least two of them.

Q And would it, sir, be appropriate to average all of those together when you've got two different analyticals being used to determine total P? 03:03PM

MS. COLLINS: Object to form.

A If it's identified as total P, it's perfectly acceptable, yes.

Q Okay. The very bottom station, RS-147, is showing a result on CDM as .047. Is that in fact 03:03PM

the -- did you round that number, sir, and if so, did you round it down?

A Well, I don't know. I don't know where RS-000147 is.

Q Well, look in your dataset and look at the same location number and the result that you use in rounding. Is that not rounded down as opposed to up? 03:03PM

A I don't know that this dataset is -- represents this point. My understanding was if we had a .037, that it would have been rounded up to .4 for example. 03:04PM

Q Well, in fact, sir, it appears to me that I'm looking at a .047 on the CDM set and on yours it's .0400 and in fact you would have rounded it down. 03:04PM

MS. COLLINS: Object to form.

A Well, either way it's a little bit irrelevant because it doesn't change any of the conclusions if in fact that data point is that particular location.

Q My point is, sir, wasn't that pretty much your method in rounding, is that when it was CDM, above .045 you would still round it down, such as we see in this example on the .047, it would be rounded down to .040? 03:04PM

MS. COLLINS: Object to form, misstates 03:05PM

testimony.
A No. I thought we looked at some samples in the last site. As a matter of fact, I identified several that were identical in both databases, so --
Q Do you see on the CDM -- well, do you see on both of them, yours and theirs, the edge of field samples, do you see those there, EOF-03? 03:05PM
A Yes.
Q And did you take your EFO-3 data, add it and average it? 03:05PM
MS. COLLINS: Form.
A I don't think I have an edge of field sample on this notation.
Q AR-17, is that what you're looking at?
A Yes. I see a sediment sample. The -- 03:05PM
Q Do you see the number 3.34 on your aerial at that location, AR-17?
A Oh, yes, I see it.
Q Okay, and I'll represent to you that if you add edge of field three numbers there, 3.8, 4.2, 1.9, divided by 3, it comes up to 3.34. Does that appear to be your edge of field? 03:06PM
MS. COLLINS: Object to form.
A Without knowing the specific location, I'll take your representation if that's what you tell me. 03:06PM

Q Okay. Well, if I look at both yours and CDM's data, the edge of field data appears to be the same for three locations; correct?

MS. COLLINS: Object to form.

Q Again, they're in different order -- 03:06PM

A Yes.

Q -- but you see them being the same, do you not?

A I do see them, yes.

Q All right. Now, do you think it's 03:06PM appropriate, sir, to have added as part of in creating the average the edge of field sampling that is done with a different testing regime? You can see two were using sixty ten and the other was using 365.2. Those are different testing analyticals, are 03:07PM they not?

MS. COLLINS: Object to form.

A Yes, but they're both reporting total P.

Q Okay, and you believe that's accurate then to take those, average them together? 03:07PM

A Yes, it's reasonable.

Q Okay.

A I'm running out of steam here.

Q On this edge of field 03 site, did you make any determination or inquiry as to whether or not 03:08PM

that is a field owned by any of the Cargill facility sites or owners of those sites?

MS. COLLINS: Object to form.

A No. It's quite a distance away. So I'd have no reason to suspect it was related to a Cargill site. 03:08PM

Q Are you aware, sir, that there are many multi-tract landowners in the IRW?

A What's a multi-tract landowner?

Q Multi-tract landowner, meaning one who might own land not contiguous, different parcels, not contiguous. 03:09PM

A I don't know what the land ownership status looks like in the IRW.

Q Do you know whether or not Cargill growers lease lands apart from the land immediately adjacent to their poultry barns for use of poultry waste application? 03:09PM

A No.

Q Did you inquire whether anybody did? 03:09PM

MS. COLLINS: Object to form.

Q In the Cargill location sites, did you inquire of any of those people whether or not they own, lease -- own or lease other lands not adjacent to their other barns or land where applied poultry 03:09PM

waste occurs?

MS. COLLINS: Object to form.

A No.

MS. COLLINS: Are you representing that you have information that indicates that this Edge of 03:10PM
Field 03 sample is taken from or nearby a farm owned by a Cargill --

MR. GARREN: I'm not representing anything. I'm simply asking him what inquiries he made as to if he knows who owns the land that that edge of 03:10PM
field test was acquired.

MS. COLLINS: Thanks for clarifying.

Q Did Cargill or its representatives provide you any documentation of the disposition of poultry waste to third parties from any of their Cargill 03:10PM
locations?

MS. COLLINS: Object to form.

MR. BURNS: Object to form.

A No.

Q Did Cargill provide you any documentation of 03:11PM
poultry waste being removed from the watershed?

MS. COLLINS: Object to form.

A No.

Q Where are the calculations that you made to either establish the average or some other 03:12PM

calculation as to the data points you used?

MS. COLLINS: Object to form.

A It's done automatically within the program.

Q Did you supply your spreadsheets that show the calculations that were performed to arrive at the points used? 03:12PM

A No, because it's inherent within the software to work these spreadsheets.

Q So the software that was used would have required a data input for the individual samples? 03:13PM

A Yeah. I mean, we looked at the comparison between the CDM database and what we used so -- and they're comparable.

Q Is the -- tell me how the data is input into the software that creates the calculation for the average that you used in order to arrive at the point that then is depicted on your aerials. 03:13PM

A Basically we got the Access database and extracted the data for sediments or surface water, and relate it using the northings and eastings, and then did the calculations within the software. That's the high level explanation. 03:14PM

Q The software is listed in your report that's used?

A Well, it's that Google Earth platform that we 03:14PM

used, yeah.
Q Okay. How are the averages determined I guess is my question to you?
A Oh.
Q Is it determined within the Google Earth software or did you arrive at an average and input it into the Google Earth? 03:14PM
A My understanding is what we did was to overlay something that we call Geoship, which takes the data and incorporates all of the total phosphorus in this case data, and that computation is done within that software and then superimposed on Google Earth at the correct northing and easting. 03:14PM
Q Is there a manipulation to the data required in order for it to provide you the average function for each of these data points where there are multiple samples? 03:14PM
MS. COLLINS: Object to form.
A Well, just to add the samples up and divide by the number. 03:15PM
Q Is that done manually or is it done by the -- is it done before it's put into the software or is it done as part of the software working with that data?
A It's part of the software working with that 03:15PM

data.
Q Okay. So you give it an instruction to average all samples at one site?
A All of the selected samples, yes. You color out based on the descriptor in the database. 03:15PM
Q Do you instruct that same software to do the rounding that appears here in your database?
A Yes. It will take it to whatever significant figures and we usually use two.
Q We've looked at several examples of the CDM database compared to your database and you can see the rounding that's done there. Was the rounding done before it goes into the computer to do the averaging or did it do the rounding for you? 03:15PM
A It does the rounding for us. 03:16PM
Q And did anybody make a determination that the rounding -- at what stage rounding occurs up and down; is it on a .5 and goes up or is it .5 it goes down; do you know?
A I don't know as I sit here today. 03:16PM
Q Are the numbers that I see in the worksheets that you provided the State, such as Davis 739 P total sediment in depth, are those the numbers that are actually used in the averaging; do you know?
A Say it again. 03:16PM

Q Look at Exhibit 11, for example. Do you have that? I haven't given it to you. Let's just look at it since it's easier. It's just a couple of pages. On your -- on the first page do you see the results column where yours are rounded? 03:16PM

A Right.

Q All right. Is that rounding done by somebody on your staff before it goes into the Google software?

A No. It is just done within the Google software. 03:17PM

Q So is this printout from that software because it's an XLS spreadsheet?

A Yes. It would just be derived -- it would be taken out of the software, dumped into Excel and that's when you can print it. 03:17PM

Q All right, and that's what you did by presenting these spreadsheets to the State of Oklahoma?

A That's correct. 03:17PM

Q Was the input directly from the Access database supplied by CDM that you would see on the next page of this same exhibit?

A Yes.

Q Let's take a break. We've got to change a 03:17PM

tape.

VIDEOGRAPHER: We are now off the Record. The time is 3:17 p.m.

(Following a short recess at 3:17 p.m., proceedings continued on the Record at 3:27 p.m.) 03:27PM

VIDEOGRAPHER: We are back on the Record. The time is 3:27 p.m.

Q Do you have Exhibit 11, Dr. Davis?

A Yes.

Q Do me a favor here and let's count the entries for your database for the RS-0234 and see if you get 17 as I did. 03:27PM

A I think that's correct.

Q And then look at the same station ID for the CDM material, which is the next page of your exhibit. Do you get 18 values there? 03:27PM

A I think that's correct.

Q Looking at the CDM values, the third one down is a .962 milligrams per liter entry. Do you see that? 03:28PM

A Yes.

Q Do you see that anywhere on your database?

A No, I don't.

Q Can you explain why that particular entry, which is the largest entry, would not be reflective 03:28PM

of what was run through your database?

MS. COLLINS: Object to form.

A Not as I sit here right now, no. I'd have to go back and find out.

Q Okay. Looking at the aerial at Page 29 of your report, and I believe it appears in your Appendix B also, there is a water sample .0167. Can you tell me where that came from on your dataset or the CDM dataset? 03:28PM

A Well, not that one without knowing the -- 03:29PM

Q I will represent to you that it's -- we believe it to be RS-234 based upon lat-longs that we've observed from your materials here.

A Okay.

Q Are you able to tell where that number came from from these datasets that apparently are tied to AR-22? 03:30PM

A I don't know. It's .0167 you're saying is 234?

Q That's what we believe it to be, and I'm looking at the dataset that you provided us for that same AR-22 that I'm trying to myself identify where it came from. 03:30PM

A Well, I don't know as I sit here right now.

Q Okay. Is the data point that's on your aerial 03:30PM

.18, is that a rounding by you of Station RS-256 that reported at CDM at .187?

MS. COLLINS: Object to form.

A That would appear to be the case, yes. That's the one that's immediately downgradient from that, appears to be a disposal area. 03:31PM

Q That clearly was rounded down, not up, wasn't it, sir?

MS. COLLINS: Object to form.

A Well, it was not actually rounded down because it's two significant figures. So it was just two significant figures. 03:31PM

Q But you've been doing rounding, and I'm trying to figure out. You've got a 1.87 or a .187 and you round it to .18. Isn't that rounding making the number smaller? 03:32PM

A Well, it's making smaller, but if it would be .180, I suppose it might be rounding down if it's taking two significant figures. Perhaps it could be .19. Either way, it's immaterial. It changes no conclusions. 03:32PM

Q Tell me, sir, what is the direction of flow on the AR-22 on the stream.

A The way it's depicted on this picture, it appears to be towards the northeast for the main 03:33PM

branch.
Q Do you, sir, know what the -- did you make a calculation to determine the mean values when there were a number of samples at the same location or did you just routinely average? 03:34PM
MS. COLLINS: Object to form.
A What do you mean mean as opposed to average? They're the same thing.
Q Well, it's just that when we've tried to average your numbers, we don't get the same thing, 03:34PM and that's why I was asking whether or not you used some other different calculation.
A To the best of my knowledge, we used the data and summed them and divide by the number of samples.
Q Okay. I believe you testified earlier today 03:34PM that the time of the sample was really of no significance to you in your analysis; is that correct?
A That's correct.
Q So if I look at Exhibit 11, the AR-22, the CDM 03:35PM portion of the database because it has dates on it, do you see on the Station 234 at the top, there's an August 10, '06 base flow of .029?
A Right.
Q And do you see at Station RS-257 on the same 03:35PM

day there's another base flow of .031. Is that significant to you in trying to find samples that are flowing perhaps on the same day as to whether or not there was any impact or not in that particular day? 03:35PM

A Well, probably not because almost all of these data seem to be pretty similar to the .029 or range between .1 and .3 or thereabouts, sorry, .1 and -- .01 and .03 or thereabouts. So they're pretty similar, with the exception of that one outlier, the 03:36PM .962, and I don't know what that's due to.

Q Okay. Do you make any inquiry as to what caused the .962 on March 27th?

A No. I don't know what the QA/QC -- if it's good or not. There may be a host of other reasons 03:36PM for that anomalous concentration.

Q You didn't report it in your report as to why you didn't use it, though, did you?

A No. I'll have to go back and look at that.

Q Let's change subjects and I'm going to ask you 03:37PM now to look at Exhibit 12, sir. Can you identify this document to the court, please?

A This is a letter I received from Faegre & Benson in November engaging our company.

Q Go to the Bates number Davis 15. Tell me what 03:37PM

that is.

A That's a budget for Phase II of our work.

Q Do you know what the budget was for Phase I?

A I don't recall off the top of my head, no.

Q I don't recall seeing anything on Phase I in your considered materials. Is there a reason why that wasn't included or was there a budget for Phase I? 03:38PM

A I think I was instructed just to do an overview of the data first off and see what I came up with. 03:38PM

Q Well, did you put anything in writing to Faegre Benson with regard to Phase I and the amounts?

A No. 03:38PM

Q Look through the rest of this exhibit and tell me if you believe this is to be representative of all of the invoices submitted by you and paid assumingly.

A I suppose through the time of the report we invoiced, yes. 03:39PM

Q Did your work change from analyzing 34 sites to 35 sites or did it stay at 34 the entire time?

A 35 the entire time.

Q Well, on Page 18 it says review of 34 sites. 03:39PM

A To be honest, I don't recall.
Q Okay. On that same page, under deliverables, the next to last one, reviewed GLEAMS model. Tell me exactly what was done regarding the GLEAMS model in that review. 03:40PM
A We were looking at the GLEAMS model to see if we could use a similar approach, but we decided it wouldn't be feasible or reasonable for this project.
Q And tell me why it wasn't feasible or reasonable. 03:40PM
A Well, time frame for one and also getting correct data inputs on a local basis. I didn't think it would be possible to use a model for a -- from a local scale on a facility-based approach.
Q So I'm clear, there was no data input into a GLEAMS model at any time? 03:40PM
A No.
Q No being correct, there was not?
A No being correct, there was not.
Q Thanks. Other than the trip that you discussed on April 1 and April 2 into the watershed you've made and the one time driving through from Little Rock, you've made no other field trips into the IRW; is that correct? 03:40PM
A Not that I recall. 03:41PM

Q Do you have any data or descriptions that describe what we see in the photos that were delivered to the State yesterday from Davis 749 to Davis 812?

A Yes. If you look at Davis 794, this is a print of the map I had with me that described where the photos were taken, the orientation. 03:41PM

Q It only tells the orientation, but it doesn't tell what you're looking at or what you identified with the site? 03:41PM

A It's pretty clear what I'm looking at because you can go to one of the photographs and see a shed or you can go to another photograph and see a cow in the water.

Q What do you tell me that you see in No. 749? 03:41PM

A In No. 749, that's Allen's Cannery.

Q And is it located on your map?

A Yes. You can see about a third of the way across from the east to the west above Route 112 there's an arrow to Allen's Cannery, arrow. 03:42PM

Q On Page 794 you've got perhaps in the lower right-hand corner a number that says ABC. What does that reference. Do you see the small letters next to the numbers?

A Oh, yeah. 03:43PM

Q What is that referencing?
A That's where I've taken three shots of that particular location.
Q And are they identified as A and B in those photos that I could tell which ones are which? 03:43PM
A Well, these photos had designators in the file name. I don't see the designators in the file name here. I see the Bates number.
Q All right.
MS. COLLINS: We can provide you with a list of those if you like. I thought that was supposed to be transmitted to you. 03:43PM
MR. GARREN: Yes.
MS. COLLINS: So I'll send you a list that shows the Bates number and the file name so you can correlate it to this map. 03:43PM
MR. GARREN: Thank you.
Q Did you at any time quantify and compare the other sources to poultry waste that are generated from the Cargill locations? 03:44PM
MS. COLLINS: I'm sorry. Could you read that question back?
(Whereupon, the court reporter read back the previous question.)
Q Let me restate that question. Did you 03:44PM

quantify and/or compare other sources of phosphorus from any of the Cargill sites in your analysis?

MS. COLLINS: Object to form.

A Well, I looked at the relationships between the site locations and the water chemistry. I'm not quite sure. So, yes, I did. 03:44PM

Q All right, and did you take into consideration septic tanks on location at any Cargill sites?

A Well, no, because those are mainly up from the sites. My sense is that septic tanks would be a more significant contributor adjacent to the water courses. 03:45PM

Q Are you talking in general now or are you talking about site-specific Cargill locations?

A In general. So if a site is an upland location, the septic tank pathway is probably not going to be very significant. 03:45PM

MR. GARREN: Can you read back his last response?

(Whereupon, the court reporter read back the previous question.)

A I think I used too many double negatives. The septic tank source issue is going to be more relevant adjacent to a water course, immediately adjacent to a water course where there's houses or 03:46PM

other structures with a septic tank.
Q And why is that in your opinion?
A Because the alluvial gravels are likely to be coarser, and there will be a greater chance for over time septic upsets and contributions from septic sources. Typically I don't believe a septic tank release would go very far just because of the nature of the soils, and so if you're in the upland areas where you have more acid soils and more aluminum and iron in the soil profile, and this goes anywhere in the uplands, not just a poultry house, I don't think septic tank releases would be of any great significance. 03:46PM 03:47PM
Q And you're saying that generally throughout the IRW; is that what you're saying? 03:47PM
A Yes.
Q All right, and for that reason, you didn't consider septic tanks at the Cargill site locations as part of your analysis?
A That's correct. 03:47PM
MR. GARREN: I'll pass the witness.
MS. COLLINS: First, Mr. Garren, for the Record, as to the aerial photos in Exhibit 6, 7 -- 6 and 7, and those are the only two we've looked at today, can you state what the source is of these? 03:48PM

MR. GARREN: Pardon me?
MS. COLLINS: Can you state what the source is?
MR. GARREN: Yeah. It's the aerial that's been provided to the defendants used by the State in this case. 03:48PM
MS. COLLINS: Okay. So these are the aerials that were previously produced in this case?
MR. GARREN: Yeah. Not recently. They've been produced some time ago. 03:48PM
MS. COLLINS: But previously produced?
MR. GARREN: Oh, I'm sorry. Previously produced, that's correct.
MS. COLLINS: And can you tell us who prepared these and drew -- I mean, this is not just the native files. There are overlays on here that show sample points and arrows indicating flow. 03:48PM
MR. GARREN: Combination of Lithochimeia and CDM.

CROSS EXAMINATION

BY MS. COLLINS:

Q Dr. Davis, if you would please turn back to your report and specifically to Page 13 for Site OK-06 and then to actually Appendix B for OK-06, I should be asking you to look at the errata of 03:50PM

Appendix B. I don't know if that's been marked as an exhibit, though.

MR. GARREN: It hasn't.

Q So referring to your errata, Appendix B, images for OK-06, on the third image do you note any groundwater sample data on this image? 03:50PM

A I think there's two points there. There's a 0.015 and a 0.025.

Q And were those two points depicted in any of the images in the original Appendix B? 03:51PM

A The .015 was, yes, and the .025 on the upper one.

Q And you're referring to the Site OK-06, Appendix B, the top photo shows which sample?

A The .025. 03:51PM

Q And the lower one shows which?

A 0.015.

Q Would you refer to Page 29 of your report for Site AR-22, and there were some discussion earlier about the sample point .18, which is a surface water sample in the lower left-hand quarter of that image. Do you remember that? 03:51PM

A Yes.

MR. GARREN: Sorry. What page, Counsel?

MS. COLLINS: 29. 03:52PM

MR. GARREN: Thank you.

Q Based on your analysis, is there any significance as to whether that sample was accurately reported as .18 or .187?

A No. It's completely transparent. 03:52PM

Q Why is that?

A Because the sample location is upstream of where the confluence from sites AR-27 and AR-28 enter the receiving stream, so it can't be impacted by any of those poultry houses and, in fact, that 03:52PM 0.18 is downstream of what appears to be a trash area as shown on the inset on that particular photo.

Q During your work on this case, did you review the expert reports of Dr. Jarman and Dr. Clay as well? 03:54PM

A I did look at Dr. Clay. I don't recall Dr. Jarman.

Q Okay, and earlier you mentioned that you made a review of some nature of the nitrate levels in environmental samples in proximity to the Cargill 03:54PM locations?

A Correct.

Q Did you draw any basic conclusions about the nitrate levels in environmental samples in proximity to Cargill locations? 03:54PM

A Yes. Using -- I used a 10 milligram per liter cutoff, and I found no apparent releases based on that particular cutoff.

Q And is that because the values you saw were below 10 milligrams per liter generally? 03:55PM

A Yes.

Q Have you determined where or why samples were rounded, sample results were rounded to two significant figures in some instances in some of the documents we've looked at where that calculation 03:56PM took place in your process?

A Well, in some instances --

MR. GARREN: Object to form.

A In some instances if there are different data points and some have got two significant figures and 03:56PM some have got three significant figures, the program automatically rounds it down to two figures or rounds to two figures.

MS. COLLINS: I don't have any other questions. 03:56PM

REDIRECT EXAMINATION

BY MR. GARREN:

Q A couple of follow-up, Dr. Davis. Is -- when you have a .187, are there two or three significant figures in that number? 03:57PM

A There are three significant figures in that number.

Q All right, and if you were to round it, where would you normally expect it to round to to get to two significant figures? 03:57PM

MS. COLLINS: Object to form.

A To .19.

Q Tell me and show me please in your report where you make any findings and conclusions with regard to nitrate in your report. 03:57PM

A There is nothing here specific to nitrate in the report.

MR. GARREN: No other questions.

CROSS EXAMINATION

BY MR. BURNS: 03:57PM

Q I have a few. On Page 4 of your report, Dr. Davis, you identify a list of other potential anthropogenic sources, and one of the categories you have listed is poultry. What do you mean by the term poultry on that list? 03:58PM

A Well, it's conceivable that maybe some locations, if the setting is right, where some contribution from fields where poultry has been applied.

Q How did you identify a potential field where 03:58PM

poultry litter might have been applied?
A Well, I didn't. I was only looking at the Cargill sites. I'm just saying conceivably it's not beyond the bounds of reason.
Q Okay. So with regard to the 35 locations I, think 35 is the right number, there aren't any that you would point to specifically that say that poultry is another potential anthropogenic source? 03:58PM
MR. GARREN: Object to form.
A Based on the data I have received and reviewed from the State, that appears to be the case. 03:58PM
Q Okay. When you were reviewing these sites -- in your review of these sites, did you identify any locations where there appeared to be other poultry farming activities in the vicinity of the Cargill location? 03:59PM
MR. GARREN: Object to form.
A When you say vicinity, what do you mean vicinity; is that a mile radius or 200 feet?
Q Two-mile radius. 03:59PM
A Yes, there's areas where there's other poultry houses within the Cargill vicinity as you've defined it.
Q Okay, and did you undertake any efforts to confirm whether those houses were actively involved 03:59PM

in poultry raising?
A No.
Q Okay, and you didn't identify what company those houses might have been in contract with?
A What other houses in the vicinity of -- 04:00PM
Q Right.
A No.
Q Okay. Did you make any assumptions regarding application of poultry litter from other houses in the vicinity of Cargill houses; in other words, did 04:00PM you assume that poultry litter was applied in the vicinity of those houses?
MR. GARREN: Object to form.
A I didn't make any assumption that any other houses other than Cargill houses that I've reported 04:00PM on this report.
Q Okay, and so to the extent you identified other poultry houses, you didn't conduct any interviews of the poultry growers that own those houses? 04:00PM
A I didn't evaluate poultry houses. I didn't talk to poultry house owners. I didn't visit poultry houses. The only ones -- except for the Cargill houses.
Q Okay. Given that you didn't evaluate poultry 04:00PM

litter application from any houses other than the Cargill houses in the report, would you agree that you would not be able to testify to a reasonable degree of scientific certainty that any other houses from any other integrator contributed any contaminants to the waters of the Illinois River watershed?

MR. GARREN: Object to form.

A I haven't investigated any of the other poultry houses, and I don't intend to testify on anything other than the Cargill houses. 04:01PM

Q Okay. You testified at some point that there were elevated phosphorus levels at surface waters in some areas in the watershed. What did you mean by the term elevated? 04:01PM

A I used 0.04 milligrams per liter as my cutoff, just based, as it points out in the report, on a .037 number that has been adopted by the State of Oklahoma, but I've also seen Engel, for example, use .05 as an acceptable level, but I used the .04 as my cutoff. 04:02PM

Q Okay. So your definition of elevated today has just been in excess of the baseline level that you used in your report?

A Well, it's not really a baseline level the 04:02PM

same way I construed the sediment baseline level. That is a number that's basically a 30-day average, which obviously hasn't been collected here, but I used that as a fallback number I suppose.

Q Okay, but you're not offering any opinion that that .04 level is an appropriate standard for water quality in the Illinois River watershed? 04:02PM

MR. GARREN: Object to form.

A That's correct.

MR. BURNS: I pass the witness. 04:02PM

REDIRECT EXAMINATION

BY MR. GARREN:

Q One more question, Dr. Davis. The Oklahoma standard that you referred to, the .037 water quality standard, do you know how that's calculated? 04:03PM

A As I understand, it's a 30-day average where you take a sample every 30 days and then look at the average, and if it exceeds the 0.037, then that's considered to be exceeding that standard.

Q You take an average -- you take a sample every 30 days; is that what you understand? 04:03PM

A No. Every day for 30 days as I understand it.

MR. GARREN: No other questions.

VIDEOGRAPHER: This concludes the deposition. We are now off the Record. The time is 04:03PM

4:04 p.m.

(Whereupon, the deposition was concluded at 4:04 p.m.)

SIGNATURE PAGE

I, Andy Davis, PhD, do hereby certify that the foregoing deposition was presented to me by Lisa A. Steinmeyer as a true and correct transcript of the proceedings in the above styled and numbered cause, and I now sign the same as true and correct.

WITNESS my hand this _____ day of _____, 2009.

_____

ANDY DAVIS, PhD

SUBSCRIBED AND SWORN TO before me this _____ day of _____, 2009.

_____

Notary Public

My Commission Expires:

_____

C E R T I F I C A T E

STATE OF OKLAHOMA)
) ss.
COUNTY OF TULSA)

I, Lisa A. Steinmeyer, Certified Shorthand Reporter within and for Tulsa County, State of Oklahoma, do hereby certify that the above named witness was by me first duly sworn to testify the truth, the whole truth and nothing but the truth in the case aforesaid, and that I reported in stenograph his deposition; that my stenograph notes were thereafter transcribed and reduced to typewritten form under my supervision, as the same appears herein.

I further certify that the foregoing 223 pages contain a full, true and correct transcript of the deposition taken at such time and place.

I further certify that I am not attorney for or relative to either of said parties, or otherwise interested in the event of said action.

WITNESS MY HAND AND SEAL this 23rd day of April, 2009.

_____

LISA A. STEINMEYER, CRR
CSR No. 386

CORRECTIONS TO THE DEPOSITION OF
ANDY DAVIS, PhD

PAGE AND LINE NUMBER	CORRECTION

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